Improving Schools

Investing in Our Future

Inquiry
Collaboration
Continuous
Improvement

Alberta
EDUCATION

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Improving Schools

Investing in Our Future

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FOREWORD

Improving Schools – Investing in Our Future provides a foundation for improving student learning and performance, along with improving aspects of schooling. Schools are microcosms of society. They are not independent of their communities, their provinces, or their countries. Families, schools, and society have a vested interest in improving education because it pays social and economic dividends. A future orientation, coupled with ongoing improvements, contributes to raising standards over the short, medium, and long terms.

Chapter 1 provides information about Alberta, which has a strong and well-established K-12 education system. Alberta's school-aged population is becoming more diverse with growing numbers of Aboriginal and immigrant students. A variety of performance measures indicates there is room for improvement in student achievement and high school completion.

Chapter 2 discusses student learning, which is the goal of education. Education is a social enterprise for promoting shared values and common goals. Schooling aims to develop individuals so they become contributing members of society. There is a large body of evidence on ways to improve learning.

Chapter 3 discusses change, the new constant. Accelerating changes in all areas of life – demographic, social, economic, and technological – will have important effects on education. What students learn today must prepare them for a future more than a decade hence when they will take their place as productive members of society both economically and socially. They must develop the knowledge, skills, and attitudes to earn a living, and respect and value our increasingly pluralistic society. They must continue to learn and embrace change as an opportunity rather than a challenge throughout their lifetimes.

Chapter 4 presents models of educational performance. The traditions of school effectiveness and improvement have different origins and intentions. School effectiveness provides a knowledge base (what works and why) while school improvement provides the vehicle (policies and practices) to change education in the desired direction. Today the two traditions are usually merged. The chapter also presents some large-scale initiatives that are based on school effectiveness and improvement. Implementation issues and strategies relate to people, infrastructure, evidence of success, sustainability, and unintended effects.

Chapter 5 presents research-based ways to improve schools. These include leadership, instructional practices, school climate, data driven decisions, building capacity, engagement, and sustainability.

Chapter 6 presents a summary and synthesis. The graphic on the cover symbolizes synthesis. It consists of four connected arrows enclosing inquiry, collaboration, and continuous improvement. The **four arrows** can refer to:

- action (planning, developing, implementing, and evaluating)
- alignment (goals, strategies, measures, outcomes)

- inquiry (collecting, analyzing, interpreting, and reporting)
- people (mind, body, heart, spirit)
- partners (home, school, district, government)

Inquiry, collaboration, and continuous improvement at the centre represent the ***modus operandi*** of school improvement.

- **Inquiry** encompasses all the elements related to collecting, analyzing, interpreting, and reporting evidence: multiple approaches (methods, data sources, perspectives, levels), and points of reference (time, groups, targets).
- **Collaboration** refers to partners and institutions working together: partners (students, teachers, administrators, and parents) and institutions (home, schools, districts, communities, universities, and government).
- **Continuous improvement** in all endeavors (learning, teaching, and schooling) is the desired outcome. It is a mindset that constantly strives to improve and to focus on the future.

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1 EDUCATION IN ALBERTA

Alberta's Education System

Alberta has a population of 3.3 million[1] (80% urban and 20% rural). More than half of Albertans live in the metropolitan areas of Edmonton and Calgary. More than 590,000 students attend Kindergarten to grade 12 in more than 2,100 schools in the province. More than 40,000 teachers, administrators and support staff serve these students. There are 355 school authorities (62 public, separate, and francophone school authorities; 13 charter schools; 120 ECS private operators; and 160 private schools). In 2004/05, $4.042 billion was spent on K-12 schooling.

Student achievement is measured at grades 3, 6, and 9 through provincial achievement tests in the core subjects, and at grade 12 there are 11 diploma examinations. Provincial standards expect 85% of students to meet the acceptable standard and 15% to achieve the standard of excellence on diploma examinations and a variable percentage to meet these standards in grades 3, 6, and 9.

Since 1995, Alberta Education has produced an annual plan and annual report. The *Alberta Education Annual Report* for the 2004/05 school year was released in September 2005. It reports results on a variety of performance measures for each of the three provincial education goals: high quality learning opportunities for all, excellence in learner outcomes, and highly responsive and responsible ministry.

Student Performance

The following tables summarize student performance on a variety of measures. Table 1.1 presents findings based on Alberta data. Student participation in provincial achievement tests at grades 3, 6, and 9 has declined by almost 2% from 2001 and 2005, whereas the achievement of students who wrote the tests improved by about 2% in the same time interval. At the grade 12 level, student participation has increased in noted diploma exams, while performance has remained stable or improved.

There has been a steady increase in the percentage of secondary students completing high school within three years (65% to 69%), with little increase in the five-year rate (74% to 75%). The annual dropout rate of students aged 14 to 18 has declined from 6.1% to 5.3%. Over the four years there has been little change in grade 12 students going directly into a post-secondary program (college, technical institute, university and apprenticeship); however, 3% more students are pursuing post-secondary studies within six years.

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[1] On July 1, 2005, Alberta had a population of 3,256,800. The province had the fastest population growth between July 1st 2004 and July 1st 2005. The population grew by 52,000 people, a rate 1.62%. Alberta received 17,400 international immigrants and net interprovincial migration was up 6,000 from the previous year. Statistics Canada *Daily*, September 28, 2005.

Table 1.1: Selected Student Performance Indicators (Alberta Data)

Achievement	2001 (%)	2005 (%)
Participation rates[1] in achievement tests	91.3	89.5
Achievement test results for students who wrote[1] – Acceptable Standard (AS)	84.6	86.0
Achievement test results for students who wrote[1] – Standard of Excellence	19.0	21.8
Selected Diploma Examinations		
Participation in English 30-1[2]	–	59
Participation on Social Studies 30	49	54
Participation in Pure Math 30	33	46
Participation in Physics 30	22	24
Achievement of AS in English 30-1[2]	–	89
Achievement of AS in Social Studies 30	85	85
Achievement of AS in Pure Math 30	77	81
Achievement of AS in Physics 30	79	84
High School Completion		
Three-year rate[3]	65	69[4]
Five-year rate	74	75[4]
Dropout rate (ages 14-18)	6.1	5.3[4]
Transition to Post-Secondary		
Four-year rate[5]	33	34[4]
Six-year rate	51	54[4]

[1] Combined results (all grades and all subjects) Alberta Education (2005a, p. 25). Results for each grade and subject are reported on pages 26-27.

[2] A new program of studies was introduced in 2003/04.

[3] Percentage of students who entered grade 10 and graduated in three years.

[4] Data as of 2003/04 school year.

[5] Grade 10 students are tracked for entry to post-secondary programs (college, technical institute, university, and apprenticeship).

Table 1.2 presents Alberta and Canadian data from Statistics Canada data. According to the Secondary School Graduates Survey, Alberta's overall graduation rate is lower at both times, with some improvement in the years between 1998 and 2003. A lower percentage of young Albertans graduate on time (typically 18 years of age) than do young Canadians in other provinces. Examining the educational attainment of 20-to-24-year-olds, a greater proportion of young Albertans have attained secondary or post-secondary non-tertiary education, the latter due largely to the higher rate of apprentices in Alberta. Nevertheless, a smaller percentage of young Albertans earned university degrees or are in education than their Canadian counterparts.

Looking at average employment income, young Alberta males earn slightly more than other young Canadian males. The reverse holds true for females, where those outside Alberta earn slightly more than those in the province. In both Alberta and Canada, males earn significantly more than females. These results suggest that young males begin working earlier than females, 7% more of whom graduate from high school on time[2].

Table 1.2: Selected Student Performance Indicators (Statistic Canada Data)

	Alberta		Canada	
	1998 (%)	2003 (%)	1998 (%)	2003 (%)
High School Graduation[1]				
Overall graduation rate	63	67	72	74
Typical-age graduation rate	55	60	62	67
After-typical-age graduation rate	8	7	10	7
Educational Attainment[2]		**2002**		**2002**
20-to-24-year-olds				
For age group not in education				
• Without upper secondary education		11.2		10.9
• With secondary or post-secondary, non-tertiary		42.6		33.3
• With tertiary education		13.1		16.5
In education		33.2		39.3
Average Employment Income[3]		**2000**		**2000**
15-to-24-year-olds				
Males		$25,472		$23,696
Females		$18,974		$19,634
25-to-34-year-olds				
Males		$42,925		$41,156
Females		$31,523		$32,264

[1] Source: Secondary School Graduates Survey, Statistics Canada, updated June 29, 2005. The Canada rate excludes Ontario and Quebec.

[2] Data from the Labor Force Survey, 2002. See de Broucker (2005).

[3] Source: 2001 Census of Canada, Statistics Canada.

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[2] Source: Secondary School Graduates Survey, Statistics Canada. In 2003, female-male typical-age graduation rates are 63% vs. 56% in Alberta and 72% vs. 62% in Canada. http://www.statcan.ca/english/freepub/81-582-XIE/2003001/update200506.htm

Student Diversity

Demographic trends are dynamic. They are influenced by unforeseen circumstances and economic factors. Geographic location is important. As noted earlier, 80% of Albertans live in urban areas. Policies can mitigate demographic trends.

As more people move to urban areas, there is pressure on Edmonton, Calgary and other cities for infrastructure. This is especially urgent during boom economic times as Alberta enjoys today. Maintaining the viability of rural communities also becomes an issue. Rural schools want access to education opportunities resulting in the need for further development of virtual schooling.

Alberta's school-aged population is becoming more diverse.

Alberta's Aboriginal population is growing the fastest. It is expected to grow by 147% by 2021 due largely to a higher projected fertility rate. In 2000, two thirds of Aboriginal Albertans lived on reserves and a third lived off reserve[3]. Proportionally twice as many Aboriginal children live in Edmonton (6%) as in Calgary (3%). Aboriginal children represent 8% of the Alberta population (ages 5 to 24) (Statistics Canada, 2004). The implications for education are that there is a growing presence of Aboriginal students, especially in the Edmonton area. There is a need for cultural sensitivity training and supports for metropolitan school authorities to assist Aboriginal learners. There is also a need for post-secondary programs to prepare Aboriginal students for careers in the trades and professions.

Another growing group is immigrant students. Most of Alberta's immigrants come from China, the Philippines, India, Korea and Pakistan. About 7% of school-age children are immigrants. Most immigrant children live in Calgary (11%) and Edmonton (8%) (Statistics Canada, 2004). These schools will need English-language training so students can become successful. As schools become more culturally diverse, promoting respect and celebrating diversity become ways to recognize and value each child.

Children living in poverty also have special needs. According to Statistics Canada (2004), about 14% of Alberta school-age children (ages 5 to 24) lived in poverty in 2000; three times as many of this age group lived with a single parent (24%) compared to living with two parents (8%). Between 1996 and 2000, three-quarters of this age group living with both parents never lived in low income; one quarter lived in low income for one year or longer. About half of those living with a lone parent never lived in low income; 21% lived in reduced circumstances for up to one year while 29% lived in this way for more than one year. One in five Alberta children (19%) lived in low income for more than one year between 1996 and 2000.

Why does family background matter? Because if policies are not put in place to assist those who most need help, the gap – between those who benefit fully from a socially just and economically vibrant society – is not reduced, but rather continues to widen. Figure 1 presents the educational attainment of groups of Albertans in 2001. The graph clearly speaks to the inequity in educational attainment of Aboriginal and immigrant groups relative to all Albertans. Almost half

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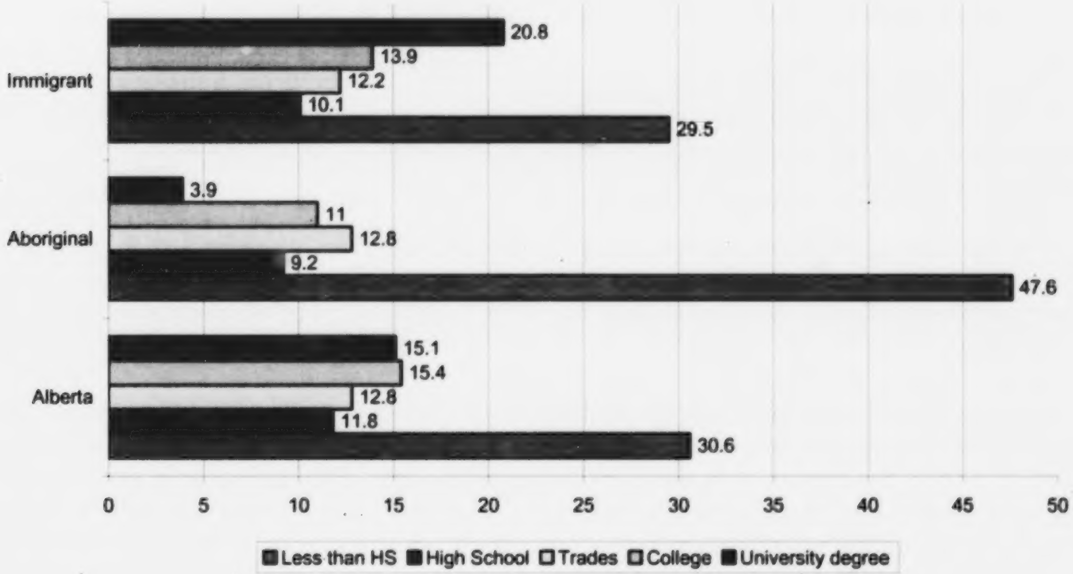
[3] Indian and Northern Affairs Canada (n.d.).

Figure 1.1: Educational Attainment of Alberta Populations (Age 15+), 2001



Source: Statistics Canada (2001).

of Aboriginal Albertans have not completed high school, compared to about 30% of immigrants and all Albertans. Furthermore, almost four times as many Albertans (15.1%) hold a university degree compared to Aboriginals (3.9%).

Synopsis

The second law of thermodynamics indicates that systems tend to slide slowly into disorder and energy tends to diminish. Inevitably the universe itself heads toward stasis. The concepts of stasis and energy follow.

Stasis[4] – A state of inactivity resulting from a static balance between opposing forces – that is, if all forces are equal and opposing, they cancel each other out. Since there is always imbalance between opposing forces, systems can either improve or decline just as a flower either grows or decays.

---

[4] Stasis refers to a condition of balance among various forces: "language is a primary element of culture, and stasis in the arts is tantamount to death (Charles March). Stasis can also refer to a stable state characterized by the cancellation of all forces by equal opposing forces. See www.answers.com/topic/statis

Laws of Thermodynamics[5]:
1. Conservation of energy – the total *quantity* of energy in the universe remains constant
2. Degradation of energy – the *quality* of the energy is degraded irreversibly

Any discussion of improvement needs to begin with a context. Alberta has a strong and well established K-12 education system. More than 40,000 teachers, administrators and support staff serve more than 590,000 students, who are taught in more than 2,100 schools administered by 355 school authorities.

The province has a centralized curriculum and assessment programs at grades 3, 6, 9, and 12. Alberta has a strong accountability system which requires the province, school authorities, and schools to prepare annual plans and reports to present the results of various programs, initiatives and strategies.

A variety of performance measures indicates that there is room for improvement in student achievement and high school completion. Between 2001 and 2005 overall student performance at grades 3, 6 and 9 has improved on provincial achievement tests at the same rate as participation in writing these tests has declined. More grade 12 students are writing selected diploma examinations and achieving higher results. The three-year high school completion rate has increased somewhat and the annual dropout rate has declined slightly.

Alberta's school-aged population is becoming more diverse with growing numbers of Aboriginal and immigrant students. As well, one in five children lived in low income for more than one year between 1996 and 2000.

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[5] In other words: (1) Energy can be changed from one form to another, but it cannot be created or destroyed. (2) In all energy exchanges, if no energy enters or leaves the system, the potential energy of the state will always be less than that of the initial state, commonly referred to as entropy.

2 STUDENT LEARNING – The Goal of Education

Education is a social enterprise for promoting shared values and common goals. Society invests in the development of its next generation through publicly funded schools. These institutions represent our collective wisdom in providing opportunities and resources for our youth to become productive members of society. It behooves all of us to make the schooling experience as productive as possible to generate not only present benefits for students, but also long-term benefits in the social and economic well-being of society.

The purpose of schooling is to develop **individuals** through:
- providing opportunities to develop the knowledge, skills and attitudes that society deems important,
- enhancing the unique talents and abilities (while at the same time)
- developing **citizens** who will contribute to society.

Inasmuch as students must assume responsibility for their own learning, their school(s) and school authority must assist them to become as successful as possible. Students are active participants in their learning. Success varies depending on many factors. Models of learning include Carroll (1963) who postulated the relationship between time spent versus time needed and identified some of the factors related to learning[6]; others include Walberg's (1984) nine-factor model of educational productivity[7], and Oakes' comprehensive model of the education system[8] (1986).

Improving schools, therefore, is a way to foster successful student learning. There is a growing body of literature on school effectiveness, school improvement, models of change, instructional strategies and practices, and others to help in the improvement of schools, which is expected to lead to the improvement of teaching and learning. This report represents a review and synthesis of the literature pertaining to this area.

Learning

School improvement must be set in the context of what we know about learning. McGeehan (2001) synthesized the findings of brain research and their connection to the way students learn into three areas – emotion, intelligence, and meaning – and ways these can be applied to the classroom.

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[6] Carroll's model describes the degree of learning as an inverse function of time needed (aptitude, ability to understand instruction, and quality of instruction) and time spent (perseverance and opportunity to learn).

[7] Walberg's model suggests that learning (affective, behavioral, cognitive) is dependent on three dimensions: aptitude (ability, development, motivation), instruction (quantity and quality), and environment (home, classroom, peer group, mass media).

[8] Oakes' model consists of three aspects: inputs (fiscal and other resources), processes (quality of school, curriculum, teaching and instruction), and outputs (achievement, participation and dropouts, attitudes and aspirations).

1. Emotion is the gatekeeper to learning – Creating safe and predictable emotional climates begins with positive relationships among teachers and students. Planning activities that build team spirit and mutual understanding to foster caring and trust increases the likelihood that students will be in an emotional state that allows them to focus full attention on the learning experiences that have been designed.

2. Intelligence is a function of experience – First-hand experiences such as visiting a pond, inspecting an earthworm up close and observing a seed become a plant, in the world outside the school and with real things inside the school have the greatest chance of sparking dendritic growth and increased synaptic connections.

3. Personal meaning is the key to memory – Only students can make meaning from incoming sensory information, and the meaning they make is based on their own prior experiences as encoded in networks of communicating neurons. Teachers must build personal relationships with students so that they can know what is meaningful to students and how they can connect curriculum to their lives (McGeehan, 2001).

Brain research confirms that the brain will retain information that it determines is important and meaningful for survival, and discard information that it decides is meaningless and of little consequence to its survival. A recognizable pattern or feature in the incoming information is a key factor in the brain's decision to keep or drop information (Westwater & Wolfe, 2000). Educational research demonstrates that previous experience enhances the understanding of new information, increased understanding and retention is achieved if the brain can retrieve stored information similar to new information, and new neural networks are created through experience – the strongest being formed from actual experience.

Vygotsky (1978) believed that the shift from needing to accomplish a task, to *accomplishing it independently constitutes learning*. Central to his theory is the belief that children learn best when parents and teachers create instructional activities that use what children already know as resources for learning new knowledge and practices.

Wang, Haertel, and Walberg (1993) developed a knowledge base for school learning. Generally proximal variables exert more influence than distal variables on school learning. The robustness and consistency of the findings suggest they can be used to inform educational policies and practices. Figure 2.1 presents their model.

Figure 2.1: Influences on Learning

Proximal Variables		**Distal Variables**
psychological instructional home environment School: • curriculum • instruction • assessment	Exert Greater Influence on Learning than	demographic organizational Policy: • state • district • school

Adapted from Wang, Haertel, & Walberg (1993).

There is more than one type of learning. Benjamin Bloom and a committee identified three domains: cognitive, affective, and psychomotor. Bloom's taxonomy (1956) is easily understood and widely used in education today. The three domains are often referred to as KSAs (knowledge, skills, and attitudes). In each domain, the categories are hierarchical in which the simplest must be mastered before the next one can take place. In education, the psychomotor domain is usually called the behavioral domain.

Table 2.1: Taxonomy of Learning Domains

Cognitive[1]	**Affective**[2]	**Psychomotor**[3]
Knowledge	Receiving	Perception
Comprehension	Responding	Set
Application	Valuing	Guided Response
Analysis	Organization	Mechanism
Synthesis	Characterization by Value	Complex Overt Response
Evaluation		Adaptation
		Origination

[1]The cognitive domain involves knowledge and development of intellectual skills. See Bloom (1956).
[2]The affective domain includes the manner in which we deal with things emotionally (such as feelings, values, appreciation, enthusiasm, motivation, and attitudes. See Krathwohl, Bloom, & Masia (1964).
[3]The psychomotor domain includes physical movement, coordination, and use of motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution. See Simpson (1972).
Note: See http://www.nwlink.com/~donclark/hrd/bloom.html for a summary of the three domains.

Covey (2004) has conceptualized humans as four dimensional – mind, body, heart, and spirit – each of which has associated needs, intelligences, attributes, and voice[9]. Table 2.2 summarizes his model, which is similar to Delors' four pillars of education[10] – learning to know, to do, to live together, and to be.

---

[9] Voice is *unique personal significance* that lies at the nexus of *talent* (natural gifts and strengths), *passion* (things that naturally energize, excite, motivate, and inspire you), *need* (including what you are paid for doing), and *conscience* (the small voice that assures you what is right and prompts you to do it) (Covey, 2004, p. 5).

Table 2.2: A Model of Human Development

Whole Person	Needs	Intelligences	Attributes	Voice
Mind	To learn	Mental	Vision	Talent – Disciplined focus
Body	To live	Physical	Discipline	Need – "see" meeting needs
Heart	To love	Emotional	Passion	Passion – Love to do
Spirit	To leave a legacy	Spiritual	Conscience	Conscience – Do what's right

Covey (2004, p. 84).

Human Development

Education aims to develop individuals so they become contributing members of society. There are both individual and societal benefits to development, referred to as human and social capital, respectively. These are defined forthwith.

Human capital – the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being (OECD, 2001, p. 18)

Social capital – Networks together with shared norms, values and understandings that facilitate cooperation within and among groups (p. 41)

The role of human capital in supporting economic and social development is a long-standing theme of government policy. Social capital – exploring social relationships – also plays a role in economic activity and human well-being. The key attributes of human and social capital follow:

- Learning is lifelong and life wide. Human capital is multifaceted.
- Human capital is embodied in individuals. Key skills and attributes are communication, numeracy, intra- and interpersonal skills, and other skills.
- Economic inequality goes hand in hand with inequality in educational access and adult literacy. Tackling disadvantage may be the key to raising overall standards.
- Human capital has a positive impact on earnings, employment, and economic growth.
- Human and social capital contributes both to growth and well-being.

---

[10] This model is elaborated in the International Commission on Education for the Twenty-first Century. (1996). *Learning: The treasure within*. Paris: UNESCO. The Canadian Council on Learning's *Lessons in Learning* is based on Delors' four pillars of education.

Some policy options for human capital follow.

1. Investments in human capital generate significant private and social benefits.
2. Social capital is linked to educational attainment suggesting that most forms of education and training could be assisted by various types of community-based networks.
3. Incentives for continual learning need to be developed.
4. Curricula and teaching methods need to give weight to interpersonal and other non-cognitive skills alongside cognitive skills.
5. Human capital investment can also help to develop social capital.
6. Training schemes need to target those most vulnerable to exclusion from the labor market (OECD, 2001).

Policies for social capital include:

1. Support for families
2. Support for voluntary initiatives
3. Government decision-making processes
4. ICT and social capital
5. Linking health care to communities

Three approaches to measuring human capital are:

1. measuring educational attainment (qualifications and years of schooling)
2. measuring adult skills directly (International Adult Literacy Survey [IALS])
3. estimating the market value of human capital (OECD, 1998)

There is evidence of eight types of benefits of human and social capital including individuals, investment, training programs, macroeconomic benefits to nations, social, health and crime reduction benefits:

1. benefits to individuals – those with more education have better employment and pay prospects and better education more than halves expected years of unemployment over work life
2. benefits of enterprise-based investment
3. benefits of public labor market training programs
4. macroeconomic benefits to nations
5. social benefits (spin-off benefits may affect public health, crime, the environment, parenting, political and community participation and social cohesion, which in turn feed back into economic well-being)
6. health outcomes of education
    - education is shown to be linked to health in terms of better health outcomes for adults with more schooling
    - better handling of health information
    - significant improvement in health outcomes for better-educated men
    - different types of advantage in countries at various stages of development
7. crime and education (appears to lessen risk of crime through helping to socialize young people who remain in school)
8. education and teenage pregnancy (OECD, 1998)

Most evidence on rates of return relates to individual benefits in additional earnings from employment associated with more education. Returns appear to be particularly high for upper secondary, and somewhat lower for tertiary education but these estimates have important limitations. Figure 2.2 presents the costs and benefits of human capital investment.

Figure 2.2: Costs and Benefits of Human Capital Investment

	Costs	Benefits	
Public	Public sector spending on education	Extra income taxes and lower social transfers paid to individuals due to enhanced earnings through education	Better health, lower crime, economic growth and greater social cohesion
Private	Private costs of education (including foregone earnings)	Higher earnings associated with more education, net of extra taxes paid	Non-monetary benefits (greater personal satisfaction and health)

"Social" return includes all the items in the diagram, but in practice those elements within the square have proven the most amenable to measurement.

OECD (1998, p. 69).

Keating and Hertzman (1999) edited a book on the health and wealth of nations including the work of prominent research scientists and scholars. The volume includes key issues in contemporary human development including sections on the gradient effect in developmental health, biology and development, the learning society, and the ecology of child development. In the final chapter, Keating concluded by identifying a number of key principles that a learning society would find useful for guiding investments in developmental health:

1. Invest in the core infrastructure
2. Network available resources and ingenuity
3. Focus on the core dynamics
4. Monitor the outcomes

Young (2002) edited a book focusing on human development that arose from a global conference that addressed the benefits and challenges of investing in early child development. Education is viewed as a great equalizer if all children have equal opportunities to take advantage of it. Further, a strategy of cooperation, interaction, and partnership among many organizations, governments and institutions is advocated for launching and sustaining broad action (p. vii).

3 CHANGE – The New Constant

Change is a constant, seemingly the only one today. Table 3.1 provides some famous quotations about change over the millennia.

Table 3.1: Change Quotations Over the Millennia

Heraclitus	*There is nothing permanent except change.*
Isaac Asimov	*It is change continuing change, inevitable change that is the dominant factor in society today.*
Mohandas Gandhi	*We must be the change we wish to see in the world.*
Edmund Burke	*We must obey the great law of change. It is the most powerful law of nature.*
Marcus Aurelius	*We shrink from change; yet is there anything that can come into being without it?*
Aldous Huxley	*There's only one corner of the universe you can be certain of improving, and that's your own self.*
Johann Wolfgang von Goethe	*We must always change, renew, rejuvenate ourselves; otherwise we harden.*
Theodore Levitt	*Creativity is thinking up new things. Innovation is doing new things.*
William Jennings Bryan	*Destiny is not a matter of chance, it is a matter of choice; it is not a thing to be waited for, it is a thing to be achieved.*
Oliver Cromwell	*He who stops being better stops being good.*
Alvin Toffler	*Change is not merely necessary to life – it is life.*
Bill Gates	*We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.*

Source: http://quotations.about.com/cs/inspirationquotes/a/Change4.htm

Trends

The Conference Board of Canada (CBC, 2005) released its latest edition of trends shaping Canada's future. Comparing Canada's relative performance to other advanced countries, the CBC used 110 indicators in six categories: economy, innovation, environment, education and skills, health, and society. The CBC found Canada to be a top-12 performer in all six categories: 12th on the economy, 5th on innovation, 8th on the environment, 3rd on education and skills, 10th on health, and 11th on society (p. 27).

In the education category CBC gave Canada a gold[11] on five education outcome indicators: high school completion, post-secondary completion, student reading – level 1 and below, student reading – level 5, and student math score. It gave Canada silver on university completion, student science score, proportion of graduates in science/math/computing/engineering, inadequate document literacy and inadequate prose literacy (p. 48).

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[11] A country achieves a gold-level performance if its score on a given indicator is in the top third of 12 countries, a silver if its score is in the middle third, and a bronze if it is in the bottom third. The 12 countries are the top half of the 24 OECD countries; the top 12 can vary from one category to another (CBC, 2005, p. 28).

The Canadian Council on Learning's *Lessons in Learning* (2005) series released a paper on student achievement[12] which addressed how much and how well our children are learning in school. Using trend data from Canada's School Achievement Indicators Program[13] (SAIP) and OECD's Programme for International Student Assessment[14] (PISA), the paper draws a number of conclusions and implications about student performance. The SAIP tests periodically assess the performance of 13- and 16-year old students on language, mathematics and science while the PISA tests assess the performance of 15-year-olds on language, mathematics and science. On both assessments, Alberta students generally perform better than the Canadian average and have ranked in the top-performing countries in language and science.

Canada is regarded as one of the most culturally and ethnically diverse countries in the world, which puts its strong international showing in a special light – one that demonstrates that valuing equity and achievement are complementary goals. A smaller gap in achievement holds the promise of greater social cohesion, as well as the promise of a population prepared to meet the demands of society and the economy (CCL, 2005, p. 6).

Indeed, quality and equity do not have to be seen as competing policy objectives. In seeking to lift overall performance, and to reduce the impact of SES background, the PISA results provide a number of policy pointers. Among them are strengthening student engagement with reading and school more generally, focusing on learning outcomes, providing schools with authority for organizing their own programs, holding schools accountable for results, and reducing social and educational differentiation among schools (OECD, 2002, p. 57).

A number of countries managed to combine high levels of performance with a relatively narrow range of differences among students – Finland, Canada, Korea, and Japan – indicating that it is possible to combine high performance standards with an equitable distribution of learning outcome (OECD, 2002).

Opportunities and Challenges

Accelerating changes in all areas of life – demographic, social, economic, and technological – will have an important effect on education. Incorporating new knowledge into the effective and efficient operation of schools is imperative.

Public education is a common good that must be appropriately and adequately resourced so that students are prepared to take their place as contributing members of society.

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[12] *Lessons in Learning* is designed to inform readers and exchange knowledge on a wide range of learning issues. The achievement report was released October 13, 2005 and is available at http://www.ccl-cca.ca/english/resources/lessons/131005.asp

[13] The SAIP tests were administered at three intervals: language skills (1994, 1998, 2002), mathematics (1993, 1997, 2001), science (1996, 1999, 2004).

[14] The PISA assessments focus on a major area at each assessment: PISA 2000 focused on reading, PISA 2003 on mathematics, and PISA 2006 on science.

Schools play several roles in addition to learning: socialization, heart of the community, and as centres for agencies working together. In addition to their social role, schools must embrace ways to facilitate student learning "outside of the school" through technology and partnerships.

Technology will play an increasingly important role in all areas of human endeavor. Ongoing technological change will exert enormous pressure on education systems to keep up: e.g., advances in bioengineering, cybernetics, molecular biology, nanotechnology, robotics, instantaneous communication, finance, and commerce, etc.

As well litigation will continue to exert influence on who has access to education, under what conditions, and so forth. Figure 3.1 identifies a number of challenges facing education today.

Figure 3.1: Challenges in Keeping Education Up-to-Date

Keeping the classroom up-to-date in the future presents many challenges:

- Changing role of teachers (facilitators) and students (more independent learners).
- Harnessing the capability of the internet to provide access to worldwide sources of information, transactions, and people.
- Learning how to use technology to bring "school" to students as well as students to the school.
- Preparing students for lifelong learning to deal with emerging knowledge and skills (including ethical challenges).
- Preparing students for an increasingly technologically driven future in careers that have yet to be imagined (e.g., entertainment exemplified by applied technologies in movies such as *Lord of the Rings* and *Harry Potter* and videogames).
- Keeping teachers up-to-date on new technologies and pedagogical strategies.
- Balancing the emerging focus on mathematics and scientific knowledge and skills with the goals of a pluralistic society – including the human need for language, culture, and citizenship.
- Accessing vocational labs and facilities through partnerships with business and post-secondary institutions.
- Ever greening technology in schools.
- Research in education is not keeping pace with industry and is not adequate for the challenges ahead.
- Increasing influence of business models in education.

Future Orientation

If school improvement is about improving student learning, then we must focus on the future. What students learn today must prepare them for a future more than a decade hence when they will take their place as productive members of society both economically and socially. They must have the knowledge, skills and attitudes to earn a living and be accepting and understanding of diversity in our pluralistic society. They must continue to learn and to embrace change as an opportunity rather than a challenge.

The Organization for Economic Cooperation (OECD)[15], an international think tank, has series of initiatives designed to explore strategic thinking. Of interest in this review is the work in education. Future-oriented reports[16] include *The Creative Society of the 21st Century* (2000), *Knowledge Management for the Learning Society* (2000), *Governance in the 21st Century* (2001), *What Schools for the Future?* (2001), and *Networks of Innovation: Towards New Models for Managing Schools and Systems* (2003).

OECD's *Schooling for Tomorrow* (SFT) was developed in response to a perceived need to inject longer-term, forward thinking into policy development in the education field. The purpose of SFT is to develop an international body of analysis, reflection and experience to contribute to long term thinking in education, especially as it relates to younger people (schooling). The expected outcome of SFT is a new set of operational "tools" to enable learning systems to inject forward thinking into school reforms. OECD explains that tools in the *SFT Toolbox for Forward-thinking, Innovation and School System Change* (the toolbox) will be analytical and methodological. Existing tools include those mentioned above. Figure 3.2 presents six scenarios organized into three major types – status quo, re-schooling, and de-schooling – that combine different elements: trends, plausible inter-relationships between clusters of variables, and guiding policy ideas.

Figure 3.2: Six Potential Schooling Scenarios[17]

1. Maintain the Status Quo – Schools resist pressures to change	2. Re-schooling – Major reform and renewal of schools	3. De-schooling – Widespread disestablishment of school systems
1.a. Bureaucratic School Systems Continue	2.a. Schools as Core Social Centres	3.a. Learning Networks and the Network Society
1.b. Teacher Exodus – The 'Meltdown Scenario'	2.b. Schools as Focused Learning Organizations	3.b. Extending the Market Model

OECD (2004).

Adopting Change.

When individuals are faced with demands for improvement and change, they experience a common set of characteristic concerns, which represent an important affective dimension in the change process. The behavioral aspects of individuals' involvement in the change process also progress through a series of levels. Figure 3.3 summarizes these dimensions, stages of concern, and levels of use (from 0 at the bottom to 6 at the top).

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[15] OECD came into force in 1961 to promote policies designed: (1) to achieve the highest sustainable economic growth and employment and a rising standard of living in member countries, while maintaining financial stability, and thus to contribute to the development of the world economy; (2) to contribute to sound economic expansion in member as well as non-member countries in the process of economic development; and (3) to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

[16] See the OECD website for these reports: http://www.oedc.org

[17] For each scenario, there are differences for attitudes, expectations, and political support; goals and functions; organizations and structures; the geo-political dimension; and the teaching force.

Figure 3.3: Stages of Concern and Levels of Use

Affective Dimension

Stages of Concern

Category	Stage	Label
Impact	6	Refocusing
	5	Collaboration
	4	Consequence
Task	3	Management
Self	2	Personal
	1	Informational
Awareness	0	Awareness

*Adapted from Hall & Hord (1987)

Behavioral Dimension

Levels of Use

Category	Stage	Label
Use	6	Renewal
	5	Integration
	4b	Refinement
	4a	Routine
	3	Mechanical
Nonuse	2	Preparation
	1	Orientation
	0	Nonuse

*Adapted from Hall & Hord (1987)

Adapted from Guskey (2000, pp. 182-186).

Changing Students

Another important consideration regarding the future is the generations. Few generalizations about generations are correct, but they do highlight trends. See Figure 3.4.

Figure 3.4: Trends in Four Generations

	Matures	Baby Boomers	Generation X	Net Generation
Birth Dates	1900 - 1946	1946 - 1964	1965 - 1982	1982 - 1991
Description	Greatest generation	Me generation	Latchkey generation	Millennials
Attributes	Command and control Self-sacrifice	Optimistic Workaholic	Independent Skeptical	Hopeful Determined
Likes	Respect for authority Family Community involvement	Responsibility Work ethic Can-do attitude	Freedom Multitasking Work-life balance	Public activism Latest technology Parents
Dislikes	Waste Technology	Laziness Turning 50	Red tape Hype	Anything slow Negativity

Oblinger & Oblinger (2005, p. 2.9).

The preceding figure highlights the differences among generations in their attributes, likes and dislikes. It also illustrates why there can be disconnects between teachers (most of whom fall into the baby boom or generation X) and students (described as the net generation). These students are digitally literate, connected, experiential, social, visual and kinesthetic. This new generation grew up with technology from infancy, which raises a number of implications[18] for providing the Net Gen with an appropriate educational experience.

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[18] This section is taken from Oblinger & Oblinger (2005) who draw their implications from a variety of sources of information on how Net Geners learn.

- Technology – The Net Gen (NG) thinks of technology in terms of the activity it enables; the NG views the internet as an access tool – a way to distribute resources rather than a resource with limitations.
- Communities and Social Networks – The NG has a tendency to work in teams or with peers and moves seamlessly between physical and virtual interaction. Net Geners use technology to network and socialize.
- First-Person Learning – Learning is participatory where knowing depends on practice and participation. Digital resources enable experiential learning; Net Geners construct their own learning by assembling information, tools and frameworks from a variety of sources. Simulations and visualizations allow them to explore and draw their own conclusions.
- Social Interaction – The NG is social and experiential; interaction becomes an important technique in learning. Computer-based instruction increases the number of questions posed from less than one per hour in a traditional class to 180 to 600 per hour.

> Digital natives accustomed to the twitch-speed, multitasking, random-access, graphics-first, active, connected, fun, fantasy, quick-payoff world of their videogames, MTV, and internet are bored by most of today's education, well-meaning as it may be. But worse, the many skills that new technology [has] actually enhanced (for example, parallel processing, graphics awareness, and random access) – which have profound implications for their learning – are almost totally ignored by educators (Prensky (2001) cited in Oblinger & Oblinger (2005, p. 2.14).

- Immediacy – Net Geners like to parallel process and multitask. The expectation of immediacy holds true for access to friends, services, and responses to questions.
- Multiple Media Literacy – Prensky[19] estimates that by the time individuals reach 21 they will have spent twice as many hours playing video games as reading (10,000 versus 5,000). The NG is more visually literate than earlier generations and is comfortable in an image-rich rather than a text-only environment.

Changing the System

System reform needs to address several issues simultaneously: curriculum and pedagogy, management and policy, teacher professional development, community engagement. Society invests in the development of its next generation through publicly funded schools. These institutions represent our collective wisdom in providing opportunities and resources for our youth to become productive members of society. It behooves all of us to make the schooling experience as productive as possible to generate not only present benefits for students, but also long-term benefits in the social and economic well-being of society.

Inertia theory derives from Newton's Law of Inertia[20]which can be applied to the social sciences as a perspective for interpreting cases of planned social change, including those known as educational development, reform, or innovation. Inertia in an education system is the complex force that resists change (Thomas, 2002, p. 3).

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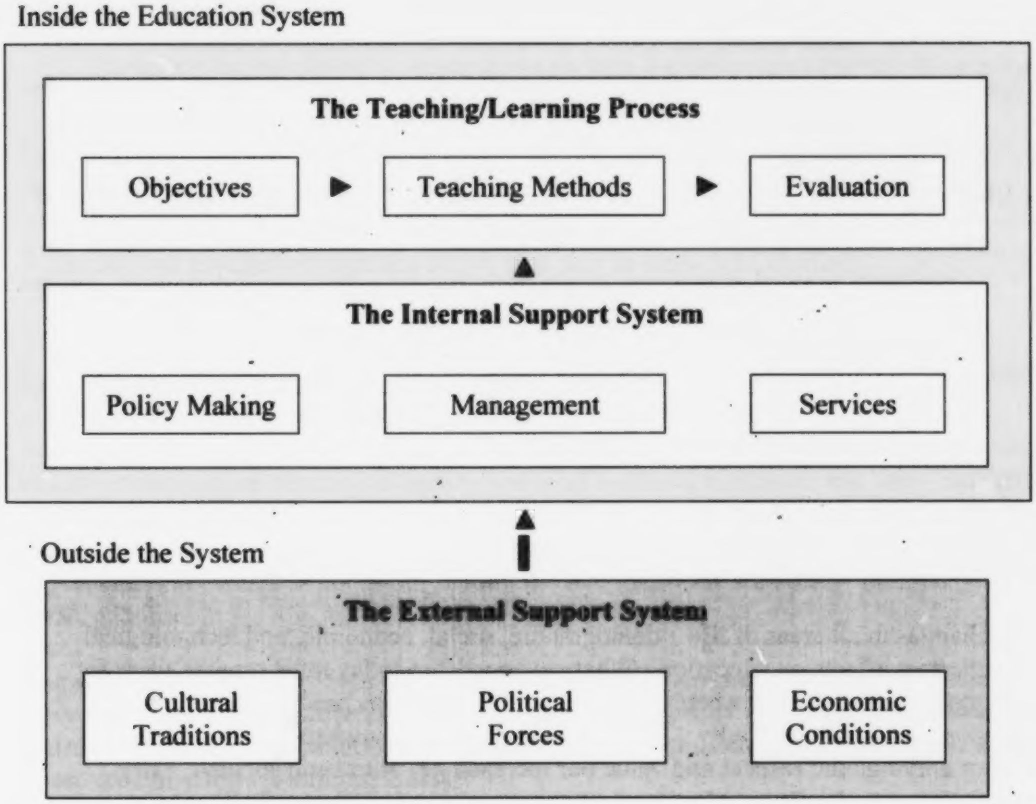
[19] Prensky (*op. cit.*)

[20] The Law of Inertia asserts that a body at rest or moving at a constant speed in a straight line will remain at rest or will continue moving in a straight line at constant speed unless acted upon by a force (Thomas, 2002, p. 3).

In his book, *Overcoming Inertia in School Reform,* Thomas (2002) discusses "why things don't change" and proposes a seven-step decision process for addressing inertia through (1) the nature of change, (2) purpose of the innovation, (3) specific changes needed, (4) barriers, (5) remedy options, (6) selection criteria, and (7) remedy selection.

Figure 3.5 summarizes the education system, which can be conceptualized as the teaching/ learning process along with two support systems that significantly influence what students learn and how well they learn it. Thomas (2002) uses this simplified model to illustrate the operation of inertia in education.

Figure 3.5: An Education System Model


Inside the Education System
The Teaching/Learning Process
Objectives
Teaching Methods
Evaluation
The Internal Support System
Policy Making
Management
Services
Outside the System
The External Support System
Cultural Traditions
Political Forces
Economic Conditions

Thomas (2002, p. 5).

System participants are key factors in the above model. Educational personnel contribute to inertia in ways described in Table 3.2. Personal characteristics can influence the success of change. While students are digitally literate, connected, experiential, social, visual, and kinesthetic, those responsible for teaching them are often resistant to change, which exacerbates the 'generational divide' separating them.

Table 3.2: Educational Personnel Characteristics

Characteristic	Proposition
Skills & Knowledge	The greater the discrepancy between the skills and knowledge of available personnel and the skills and knowledge required for a proposed innovation, the greater the resistance to the change.
Interests and Motives	The less that a proposed innovation appeals to the interests and motives of a person who is expected to participate in that innovation, the less energetically that person will support the change and, consequently, the greater the resulting inertia.
Commitment	The more strongly an intended participant in educational change is committed to the existing way of doing things (rather than a proposed innovation), the greater the inertia the innovation will face.
Comprehension	The more complex the process of changing a participant's behavior, the greater the resistance to the education innovation that requires such a change.
Perceived Risk	The more serious the perceived risk of an innovation for the welfare of participants, the greater the participants' opposition to the innovation. Individuals' sense of risk may not be constant throughout the conduct of a reform effort but may change from time to time, thereby resulting in their resisting the project more at one time than at another.
Compatibility	The greater the disrespect and antipathy among participants whose cooperative effort is required for a reform to succeed, the greater the inertia the reform will suffer.

Thomas (2002).

Synopsis

Accelerating changes in all areas of life – demographic, social, economic, and technological – will have important effects on education. What students learn today must prepare them for a future more than a decade hence when they will take their place as productive members of society both economically and socially. They must develop the knowledge, skills, and attitudes to earn a living, and respect and value our increasingly pluralistic society. They must continue to learn and embrace change as an opportunity rather than a challenge throughout their lifetimes.

Addressing people's stages of concern and levels of use helps them to deal with change. Systemic reform must address several issues simultaneously. Changing the education system requires examining the teaching/learning process and its support systems. A major issue is the inertia that resists change and fosters "business as usual".

4 MODELS

Creating powerful and effective learning experiences for students is the heartland of school improvement.[21]

There is an extensive body of research on ways to improve educational performance (e.g., Fraser, Walberg, Welch, & Hattie, 1987; Hattie, 1992; Wang, Haertel, & Walberg, 1993; Creemers, 1994; Hattie, Biggs, & Purdie, 1996; Scheerens & Bosker, 1997; Wright, Horn, & Sanders, 1997; Marzano, 1998, 2000; Hedges, 2000; Marzano, Pickering, & Pollock 2001).

> The cumulative research of the last 40 years provides some clear guidance about the characteristics of effective schools and effective teaching. ... when the research undertaken during the last four decades is considered as a set, there is ample evidence that schools can and do make a powerful difference in the academic achievement of students. (Marzano, 2000, pp. 1-2)

School improvement as an approach to educational change rests on a number of assumptions: the school is the centre of change, there is a systematic approach to change, the internal conditions of schools are a key focus, accomplishing goals more effectively, there is a multi-level perspective, implementation strategies are integrated (linkage between top down and bottom up), and there is a drive toward institutionalization (Reynolds & Teddlie).

Integrating School Effectiveness and Improvement

School effectiveness and school improvement have different origins and intentions. School effectiveness is more directed to finding out what works in education and why. School improvement is practice and policy oriented and intended to change education in the desired direction. In the orientation on outcomes, input, processes, and context in education, both approaches have much in common. Today the two traditions are usually merged (Creemers, 2002, p. 343).

The metaphor of the journey is often used to describe school improvement. This image represents an attempt to differentiate the emphasis on capacity building and teaching and learning, from quick-fix solutions and short-term responses that characterize many school improvement efforts (Hopkins, 2001).

In his work with countries all over the world, Hopkins (2001) has found that raising levels of achievement, enhancing the learning repertoires of students, and the creation of powerful learning experiences are educational challenges that are independent of the Gross Domestic Product. Despite wide variation in settings, the response is remarkably similar. Effective teaching and learning do not appear to be culturally bounded, nor are the organizational settings in which they occur (p. xiii).

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[21] Hopkins (2001, p. xii).

School Effectiveness

The International Handbook of School Effectiveness Research (Teddlie & Reynolds, 2000) examines the historical and intellectual foundations of school effectiveness research, its knowledge base, issues, and future. Their nine process areas of effective schooling, based on a distillation of the reviews of Levine and Lezotte (1990) and Sammons, Hillman, and Mortimore (1995) follow:

1. Effective leadership
2. Effective teaching
3. Focusing on learning
4. Positive school culture
5. High expectations for all
6. Emphasizing student responsibilities and rights
7. Monitoring progress at all levels
8. Staff development
9. Parental involvement (Reynolds & Teddlie, 2000)

Scheerens (2000) summarized the characteristics of several studies in Table 4.1. The reviews explored what works, providing lists of effectiveness-enhancing conditions. The lists indicate wide consensus on achievement orientation (closely related to high expectations); cooperation; leadership; monitoring; and time, opportunity to learn, and structure.

Table 4.1: Summary of Effectiveness-Enhancing Conditions of Schooling

Purkey & Smith (1983)	**Levine & Lezotte (1990)**	**Scheerens (1992)**	**Cotton (1995)**	**Sammons, Hillman, & Mortimore (1995)**
Achievement-oriented policy	Productive climate & culture	Pressure to achieve	Planning & learning goals	Shared vision & goals
Cooperative atmosphere, orderly climate		Consensus, cooperative planning, orderly atmosphere	Curriculum planning & development	A learning environment, positive reinforcement
Clear goals on basic skills	Focus on central learning skills		Planning & learning goals	Concentration on teaching & learning
Frequent evaluation	Appropriate monitoring	Evaluative potential of the school, monitoring pupils' progress	Assessment (district, school, classroom)	Monitoring progress
Inservice training / staff development	Practice-oriented staff development		Collegial learning	A learning organization
Strong leadership	Outstanding leadership	Educational leadership	School management & organization, leadership & school improvement, leadership & planning	Professional leadership
	Salient parent involvement	Parent support	Parent community involvement	Home-school partnership

Table 4.1 continued

Purkey & Smith (1983)	**Levine & Lezotte (1990)**	**Scheerens (1992)**	**Cotton (1995)**	**Sammons, Hillman, & Mortimore (1995)**
Time on task, reinforcement, streaming	Effective instructional arrangements	Structured teaching, effective learning time, opportunity to learn	Classroom management & organization, instruction	Purposeful teaching
High expectations	High expectations		Teacher-student interactions	High expectations
				Pupil rights & responsibilities
			District-school interactions	
			Equity	
			Special programs	
		External stimuli to make schools effective		
		Physical & material school characteristics		
		Teacher experience		
		School context characteristics		

Scheerens (2000, pp. 45-46).

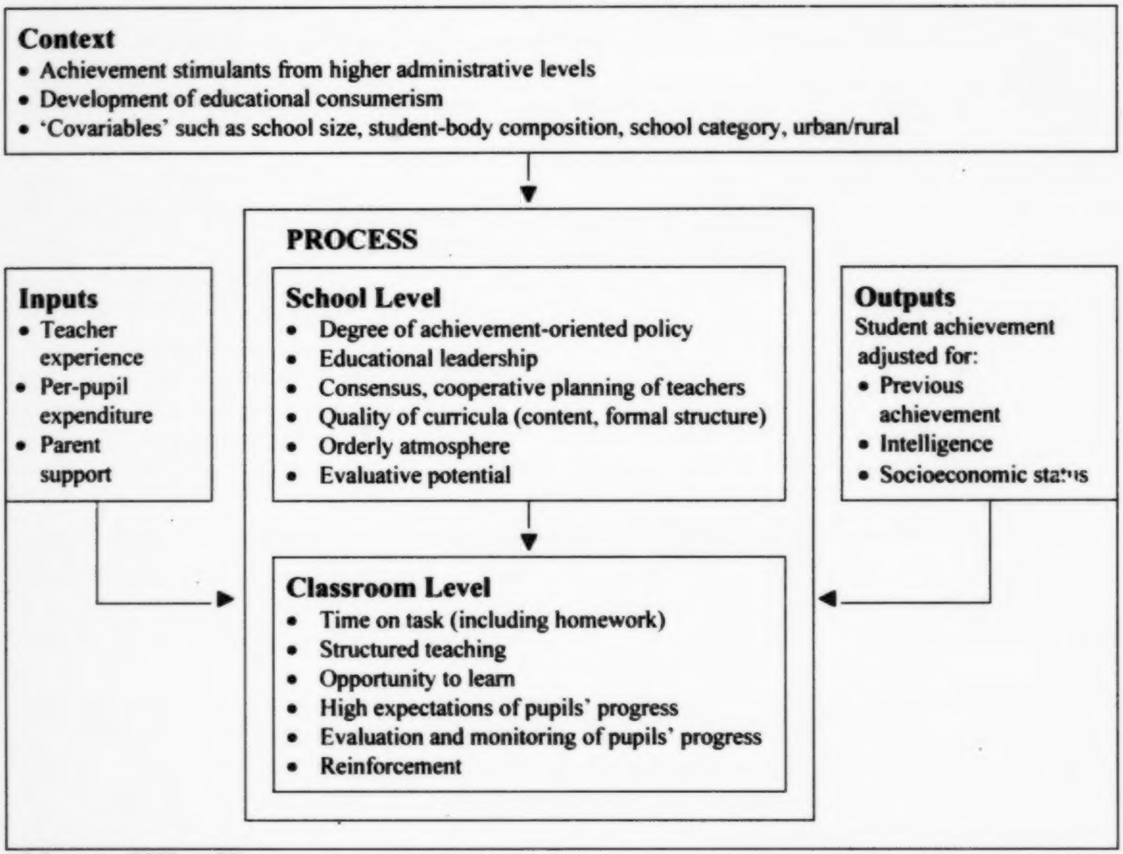
Scheerens (2000) further summarized the main characteristics of five research traditions. These are presented in Table 4.2. Recent school effectiveness studies integrated these approaches in their models and choice of variables, making a synthesis between production functions, instructional effectiveness, and school effectiveness possible. Conceptual models according to this integrative perspective include those by Scheerens (1990), Creemers (1994), and Stringfield and Slavin (1992). Figure 4.1 presents Scheerens' integrated model of school effectiveness.

Table 4.2: General Characteristics of Five Types of School Effectiveness Research

Types of Research	**Independent Variable Type**	**Dependent Variable Type**	**Discipline**	**Main Study Type**
(Un)equal opportunities	SES status and IQ of pupil, material school characteristics	Attainment	Sociology	Survey
Production functions	Material school characteristics	Achievement level	Economics	Survey
Evaluation of compensatory programs	Specific curricula	Achievement level	Interdisciplinary pedagogy	Quasi-experiment
Effective schools	'Process' characteristics of schools	Achievement level	Interdisciplinary pedagogy	Case study
Effective instruction	Characteristics of teachers, instruction, class organization	Achievement level	Educational psychology	Experiment Observation

Scheerens (2000, p. 53).

Figure 4.1: An Integrated Model of School Effectiveness



Context

- Achievement stimulants from higher administrative levels
- Development of educational consumerism
- 'Covariables' such as school size, student-body composition, school category, urban/rural

PROCESS

Inputs

- Teacher experience
- Per-pupil expenditure
- Parent support

School Level

- Degree of achievement-oriented policy
- Educational leadership
- Consensus, cooperative planning of teachers
- Quality of curricula (content, formal structure)
- Orderly atmosphere
- Evaluative potential

Outputs

Student achievement adjusted for:

- Previous achievement
- Intelligence
- Socioeconomic status

Classroom Level

- Time on task (including homework)
- Structured teaching
- Opportunity to learn
- High expectations of pupils' progress
- Evaluation and monitoring of pupils' progress
- Reinforcement

Scheerens (2000, p. 54).

Scheerens (2000) noted that the integrated model of school effectiveness is comprehensive in that it encompasses input, process, output, and context conditions and recognizes the multi-level structure of education, yet it has a number of limitations:

1. It typically focuses on individual schools, rather than education systems.
2. It has a strong instrumental focus, treating goals and objectives as largely 'given'.
3. It has a relatively narrow quality orientation, inadequately addressing equity (pp. 65-66).

Types of Effectiveness Models – There are four types of effectiveness models, which can be depicted by two dimensions: one that represents flexibility versus control, the other internal versus external orientation.

- Rational Goal – The effectiveness perspective, in which the school effectiveness model fits, is part of this model, where productivity and efficiency are the central criteria.
- Open System – This model uses growth and resource acquisition as effectiveness criteria. It emphasizes the responsiveness of schools with respect to environmental requirements.
- Human Relations – The central criterion is human resource development. This model is concerned with the social and cultural aspects of what keeps organizations together.

- Internal Process – This model concerns itself with stability and control. It reflects a preoccupation with formalization and structure (Scheerens, 2000, p. 106).

The rational goal model does not specify which educational objectives are relevant. In addition to knowledge and skills in basic school subjects, social, emotional and moral development, and the development of general cognitive skills can be addressed (Scheerens, 2000, p. 107).

As a result of his review, Scheerens (2000) drew three conclusions:

- Empirical school-effectiveness research addresses important areas of school functioning in its focus on modes of schooling that make a difference in the value-added performance of schools in traditional basic subject areas. However, it does not cover all relevant educational goals and criteria of effectiveness.
- Although results indicate that malleable conditions closer to the primary process of instruction and learning have a more substantial impact than distal factors, levels above schools (e.g., districts, provinces) should pursue improving schooling, particularly when these are designed as indirect measures to improve conditions for effectiveness within schools.
- Despite consensus in the more qualitative reviews of research evidence, quantitative research syntheses and international comparative studies show considerable uncertainty on the generalizability and actual effect sizes of factors that are considered to work. Therefore, educational planners should not use the set of factors as a uniformly prescriptive blueprint of what should happen in schools (p. 120).

> The notion of schools as semi-autonomous organizations that have a certain amount of control over their own effectiveness fits in well with the policies of functional decentralization ... It is more probable that the curriculum and assessment function will be centrally controlled ... Creating local conditions that stimulate community and parental involvement, and enhancing the evaluation function, are seen as examples of indirect and minimal control. (Scheerens, 2000, p. 121)

Wrigley's (2004) review of school effectiveness echoes Scheerens' conclusions. Reductionism has been a necessary feature of the experimental method of Western science and contributed to its rapid development, despite present concerns that a blinkered view leads to ecological and social damage (p. 229). Table 4.3 presents four aspects of reductionism that can provide a structure for examining school effectiveness. Methodological issues relate to determining what makes schools effective. Contextual reductionism relates to the relationship between a school and its environment which is complex, dynamic and reciprocal, in effect, arguing for looking at multiple schools in a district. Historical reductionism refers to how school effectiveness research in the United Kingdom was a consequence of the marketization of education in the 1980s. And moral reductionism refers to the need for researchers to acknowledge and anticipate the social impact of their work.

Table 4.3: Types and Examples of Reductionism

Type	Examples
Methodological	Causality – a belief in one-to-one correspondence (e.g., concept of IQ refines a broad spectrum of abilities to a single quantifiable factor, which can be measured through a written test)
Contextual	Ability (quantified as IQ) is seen as innate, and unaffected by learning)
Historical	Burt's (1943) promotion of the theory of innate general intelligence. The notion of IQ served a political purpose in its time, justifying serious limits on the education of most working-class children.
Moral	The assertion of a scientific methodology makes it easier to place policies beyond dispute.

Wrigley (2004, pp. 229-230).

School Improvement

School improvement went through a number of phases. Beginning in the 1960s, the emphasis was on the adoption of curriculum materials. The second phase during the 1970s was essentially one of documenting the failure of the curriculum reform movement to affect practice. The third phase – the late 1970s to mid-1980s – was a period of success, during which most of the early studies of school effectiveness were published. We are currently in the fourth phase, characterized by managing change (Reynolds, Teddlie, Hopkins, & Stringfield, 2000).

OECD's International School Improvement Project (ISIP) took a holistic and systemic view of educational change. It proposed a different way of thinking about change in which school is regarded as the centre of change. ISIP defined school improvement as:

> A systematic, sustained effort aimed at change in learning conditions and other related internal conditions in one or more schools, with the ultimate aim of accomplishing educational goals more effectively. (van Velzen *et al.* (1985, p. 48) cited in Hopkins (2001, p. 55)

According to ISIP, school improvement as an approach to educational change rested on a number of assumptions:

- The school is the centre of change
- A systematic approach
- A key focus is the 'internal conditions' of schools
- Accomplishing educational goals more effectively
- A multi-level perspective
- Integrative implementation strategies
- A drive toward institutionalization (Hopkins, 2001, p. 55)

School effectiveness research and theory can provide insights and knowledge to be used in school improvement, which is a powerful tool for testing theories. In recent years, there are examples of further productive cooperation between the two approaches, in which new ways of merging between the two traditions/orientations are attempted.

The growing enthusiasm for combining the school effectiveness and school improvement perspectives has led to using the school improvement vehicle and the school effectiveness knowledge base to enlarge our understanding. Historically the two approaches had different traditions. Table 4.4 summarizes the two approaches.

This new integrative approach combines elements of both traditions, using mixed methods rather than either quantitative or qualitative ones exclusively.

Table 4.4: A Comparison of School Effectiveness and School Improvement

School Effectiveness	School Improvement
1. a pragmatic response to policy initiatives	1. bottom-up orientation
2. a commitment to quantitative methods	2. qualitative research methodology
3. formal organization of schools	3. changing organizational processes rather than outcomes of schools
4. focus on outcomes	4. treat educational outcomes as problematic
5. focus on description of schools as static, steady-state organizations	5. schools as dynamic requiring extended study

Hopkins (2001, pp. 56-57).

Contemporary school improvement is becoming increasingly complex. Approaches are becoming more sophisticated while at the same time the pressure for externally imposed change is increasing (Hopkins, 2001, p. 57). A range of responses is taking place to address the challenges of external change. The response can be analyzed across two dimensions; the first contrasts the response as either curricular or organic (i.e., building capacity to manage change); the second dimension contrasts the response as either comprehensive (adopting a well developed, tried and tested program) or diffuse (school relying on its own resources).

A diffuse-curricular response is most common. This response includes monitoring performance, introducing extra classes for certain groups of students, implementing codes of conduct, giving students greater responsibility, etc. The diffuse-organic response includes individual approaches, teachers, and classrooms, without addressing how these changes can fit in with and adapt to the organization and ethos of the school. When the "door" leads only to a cul-de-sac, it partially explains the uneven effect of most educational reforms. The comprehensive-curricular response dates to the 1960s and the curricular reforms. Although many well specified curricula were developed, few were sufficiently comprehensive to integrate both curriculum content and instructional strategies. The comprehensive-organic response is found in various school improvement networks that are based on a particular philosophy or set of principles. Comprehensive approaches to school improvement appear to be the most effective in enhancing student achievement and the realization of national education policies (Hopkins (2001). Despite differences in foci and emphases between comprehensive curricular and organic programs, in practice they share many features. Hopkins cites the 'Success for All' (Slavin *et al.*, 1996) and 'Improving the Quality of Education for All' (Hopkins *et al.*, 1996) projects as exemplars of authentic school improvement programs.

The merger of school effectiveness and school improvement began in the early to mid-1990s. Tools for practitioners included 'value added' measures of performance, strategies for implementation, staff development, and planning focused on learning. Reform initiatives also reflected a more centralized attempt to reform schooling over a medium-term time frame (Hopkins, 2001). Table 4.5 presents examples of the two responses to external change.

Table 4.5: Examples of School Improvement Responses to External Change

	Curricular		Organic	
Diffuse	'The common curriculum of school improvement'	Gray *et al.* (1999)	'The "doors" approach to school improvement'	Joyce (1991)
	Effects: • A ceiling on the amount of improvement. • It can bring a school from moderately low to average level of performance. • Effect is short-lived; plateaus or decreases after two years.		**Effects:** • Diffuse responses (i.e., individual changes/teachers/classrooms) are inadequate. • They do not match the criteria for authentic improvement.	
Comprehensive	"Success for All'	Slavin *et al.* (1996)	'Improving the quality of education for all'	Sizer (1989) Fullan *et al.* (1990) Comer (1992) Glickman (1993) Hopkins *et al.* (1996)
	Effects: • Integration of content and pedagogy is associated with high levels of student achievement (Slavin & Fashola, 1998). • Few current programs use research-based approaches to curriculum, instruction, assessment, and classroom management.		**Effects:** • The emphasis on principles, capacity building, and whole school processes is often at the expense of innovation at the classroom level. • Without expanding the teacher's repertoire of instructional strategies, these programs will not have any significant impact on student achievement.	

Adapted from Hopkins (2001, pp. 58-63).

Hopkins (2001) identified ten principles of authentic school improvement:

- achievement focus
- empowering in aspiration
- research based and theory rich
- context specific

- capacity building in nature
- enquiry driven
- implementation oriented
- interventionist and strategic
- externally supported
- systemic (pp. 16-17)

Critiques

School improvement's increasing sophistication, and its emphasis on culture, complexity theory, and processes of corporate reflection, cannot in themselves challenge the moral limitations derived from the effectiveness tradition. Wrigley (2004) believes that school effectiveness and school improvement have come too close to one another, and that the effectiveness discourse has had far too limiting an influence on how improvement is conceptualized. The extent of disillusionment, the exodus of new teachers from the profession, the angst of school leaders, and the international strength of dissident voices are creating a genuine opportunity, despite the global drive toward effectiveness in 'economic rationalist' terms, to build a movement for real improvement in education (p. 242).

A second critique explores the system factors in school improvement. Byrne and Gallagher (2004) suggest that strategies for school improvement appear to be based on an assumption that schools operate as autonomous units, hence the privileging of school-based characteristics that are taken to provide indicators of effectiveness. However, if systemic relationships among schools are recognized, then it may be that establishment of effective characteristics in one school may simply shift problems onto other schools in the system rather than dealing with underlying issues. A large-scale examination found that the effects of the selective system of education in Northern Ireland[22] actually exacerbates the pressures identified above. A system of academic selection, allied with open enrolment, exaggerates systemic pressures and creates a situation where most of the negative consequences of the system bear down on a limited number of secondary schools, typically those located in urban areas and serving disadvantaged communities (p. 161).

Criticisms of school effectiveness and school improvement have focused on the value of 'lists' and particularly the nature of causality; the extent to which findings are serving political agendas or the way research is used to pursue political agendas; absence of research which accounts for structural inequalities; arguments surrounding the school improvement debate are oversimplified; and schools are treated as if they are non-interacting entities (Byrne & Gallagher, 2004, p. 162).

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[22] Their article concentrates on the relationship between schools as part of a school system. Grammar schools are permitted to select students on the basis of their academic ability as measured by the Transfer Tests. Using data for the proportion of students with A or B grades entering each grammar school from 1993 to 1997, schools were rank-ordered on the basis of these data and then divided into four equal groups. The proportion of students with A or B grades varied between 99 and 100% for the top group, 96 and 98% for the second group, 90 and 96% for the third group, and 59 and 90% for the fourth group. Within each group the schools were rank ordered on the basis of the proportion of girls in the schools. Then, within each cohort the schools at the 33rd and 66th percentiles were selected for the sample. All eight schools agreed to participate in the study. ((Byrne & Gallagher, 2004, p. 166).

Gewirtz (1998) is among those who have argued that debates surrounding school effectiveness and school improvement research have been oversimplified; based on her research she contends that "school 'success' contributes to 'good' management and teaching and school 'failure' contributes to 'less' effective teaching and management" (p. 454). Byrne and Gallagher's data support these conclusions.

In Northern Ireland, changes following the 1989 education reforms (e.g., grammar schools may select on the basis of achievement, open enrolment resulting in a decline in overall ability profile of students as well as a decline in numbers) have disadvantaged secondary schools. The concentration of lower ability students, combined with a much higher concentration of students from socially disadvantaged backgrounds than one would find in grammar schools, have left many secondary schools coping with a much more demanding, and in some cases, a much more difficult, cohort of students. Diversity in purpose is constrained by competition and open enrolment, not enabled by it (Byrne & Gallagher, 2004, pp. 179-180).

The study underlines the importance of the interdependent relationships that exist among schools. Moreover, it emphasizes the need to take account of these interdependencies in the determination and application of policies for change.

Effective School Improvement

Effective School Improvement (ESI) was designed to investigate the relation between effectiveness and improvement in order to increase the possibility for schools to improve education. ESI refers to planned educational change that enhances student learning outcomes as well as the school's capacity for managing change (Creemers, 2002, p. 344). The project has two related research tasks: (1) The analysis, evaluation, and synthesis of theories that might be useful for effective school improvement. (2) The inventory, analysis, and evaluation of ESI programs in different European countries. The final objective is to develop a strategy, supported by empirical evidence, for school improvement that results in effective schools. Eight countries participated in the project[23].

The theoretical analysis incorporates seven different points of view:

1. school effectiveness paradigm
2. school improvement paradigm
3. organizational theories
4. curriculum theories
5. behavioral theories
6. theories of public choice
7. theories of organizational learning and human resources management (Creemers, 2002, pp. 345-346)

Each point of view is expanded forthwith.

1 & 2 Integrating the Paradigms – The primary criterion is the output criterion, traditionally viewed as achievement in basic cognitive skills. We need to broaden the concept of school and classroom effectiveness from achievement scores in basic school subjects to a new operational

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[23] Belgium, Finland, Greece, Italy, The Netherlands, Portugal, Spain, and England.

definition of educational effectiveness in terms of the realization of other and more ambitious cognitive and metacognitive goals, such as problem solving, creative thinking, other higher cognitive skills, knowledge transfer, and learning to learn. The output criterion has to be broadened to include other achievements implying higher order cognitions and metacognitions, (Creemers, 2002, p. 346).

A comprehensive model of educational effectiveness involves the overall multilevel structures with three levels in addition to the student level: context, school, and classroom/teacher levels. School culture involves shared goals and responsibility for success. Other requirements are collegiality, risk taking, mutual respect and support, openness and an attitude of lifelong learning. A four-stage cycle of needs assessment, planning, implementation, and evaluation underlies all change processes.

3. Organizational Theories – There are three perspectives (which Fullan [1991] called supportive conditions).

1. Adaptability or responsiveness to external circumstances or changes
2. Continuity of the organization in terms of stability of the internal structure and acquisition of resources
3. Commitment and satisfaction of the members of the organization

Organizational theories provide models that link school organizations to their primary productive processes (e.g., professional bureaucracies, loosely coupled systems, organizational culture, leadership, commitment and participation of teachers, and high reliability organizations).

4. Curriculum Theories – These theories provide other models that link the school as an organization to the work of the teacher. Examples are:

1. curriculum implementation strategies (e.g., fidelity perspective, mutual adaptation perspectives, or strategies of curriculum enactment)
2. models of control (from central control to models of empowerment of teachers)

5. Behavioral Theories – Schools do not change if the people in them do not change. Behavioral theories in social psychology explain work towards change in behavior by stressing the mechanisms of evaluation, feedback and reinforcement, which work in explaining and improving effective instruction in classrooms.

6. Public Choice – Public or collective choice theories describe collective processes in terms of exchange mechanisms and responsiveness. Public choice theories are compared with individual choices (ideally the rational choices of individual consumers in a free market) and with interactive choices (ideally the optimal choices of game theory in bargaining situations). Public choice theories deal with political processes of choice, with power (distribution), with agendas of the powerful, with planning processes, and with the consequences of these different processes in terms of the distribution of welfare, income, (human) rights, and education (Hargreaves Heap *et al.*, 1992, cited in Creemers, p. 350). Choice is seen as a decentralized and market-oriented alternative to bureaucratic controls that frequently result in imperfect exchanges and insufficient responses. Theories of educational change and innovation may be interpreted as efforts to render such counterproductive factors harmless (Fullan, 1991, cited in Creemers, 2002, p. 351).

7. Organizational Learning Theories – **Organizational learning is involved in all processes of adaptation to a changing environment, and in processes of purposeful change to improve a school's effectiveness. *Learning of educational organizations* may be conceptualized by information richness, organizational procedures of processing and interpreting information, procedures for evaluation and monitoring, interpersonal networks of sharing and discussing information and organizations as makers of meaning by incremental adaptation, intellectual learning style and assumption sharing (p. 351).**

Analysis of strategies related to "learning to learn" in "rich learning environments", with a focus on "learning from experience" and "learning from practice" may also provide insight by analogy into the learning of educational organizations (p. 351).

In evaluating ESI, Stoll, Wikeley and Reezigt (2002) advised caution before transferring the findings from one context to another. They found four contextual differences between countries influencing improvement: national attitudes to education, views of intelligence, chances of success in schooling, and employment opportunities (Mortimore *et al*., 2000 cited in Stoll *et al*., p. 456).

Stoll *et al.* (2002) raised a number of issues in discussing the eight country case studies.

1. Context – **This issue underpins the other seven issues.**

2. Research methodology
    1. **analysis of the school (unit of analysis)**
    2. **definitional – what is a school?**
    3. **data gaps for older projects**
    4. **focus of improvement**
    5. **source or origin of improvement**
    6. **inability to capture sensation of visiting a school**
    7. **instruments were better at capturing school effectiveness than improvement**
    8. **research orientations differed**
    9. **schools' expectations of their involvement in these programs including overload**

3. Outcomes – **Research should look at value added, that is, a broader range of outcomes. Because improvement is an active process, one should consider how the process occurs.**

4. Journey of improvement – **Projects should define and explain both successes and failures.**

5. Change agents – **External agents provide pressure to innovate whereas internal change agents have a key role in terms of implementation, coordination and "making things happen". Political leadership seemed to influence the direction of initiatives.**

6. Capacity and sustainability – **Capacity can be developed. But when the external change agent is no longer involved, effects did not last (Netherlands and Belgium). It is useful to have a flexible contingency approach to planning. Lack of time for dialogue and reflection**

appears to be important for teachers. The culture of schools or teachers plays an important role in sustaining improvement in all ESI countries.

The authors concluded by raising a number of questions among them, "can sustainability be adequately explored through retrospective case studies or secondary data analysis, or are longitudinal studies essential?" (Stoll *et al.*, 2002, p. 470)

Large-Scale Improvement Initiatives

The previous section summarized the traditions of school effectiveness and school improvement, which today are usually integrated. These traditions have informed the development and implementation of improvement initiatives.

Fullan (1999) defined large-scale reform as meeting two criteria: the focus of reform is on the entire system, and/or a minimum of 50 schools and 20,000 or more students (p. 3). Large-scale reform can be at multiple levels: the whole school, the school district, the province or state, and the nation.

Reformers want not only to initiate large-scale reform, but also to sustain it. Fullan posited eight interactive factors:

1. upgrade the system context
2. become preoccupied with coherence-making in the service of instructional improvement and student learning
3. establish plenty of cross-over structures
4. downward investment/upward identity
5. invest in quality materials (instruction and training)
6. integrate pressure and support (set targets/build capacity)
7. get out of implementing someone else's reform agenda
8. work with systems (p. 15)

The 1999 American Institutes for Research (AIR) review of 24 models of school reform found three demonstrated strong evidence of positive effects on student achievement (Direct Instruction, High Schools That Work, and Success for All); five showed promising effects (Community for Learning, Core Knowledge, Different Ways of Knowing, Expeditionary Learning Outward Bound, and School Development Program); six had marginal effects (including Accelerated Schools), and ten provided weak or no evidence of impact (including Coalition of Essential Schools and Paideia) (AIR, 1999). Four school-wide reforms did not meet Fullan's criterion of 50 or more schools; two of these demonstrated marginal evidence of success and two had no research.

Large-scale improvement initiatives have become more prevalent as states and provinces, school districts and schools work toward improving student learning. Initiatives vary in scope, goals, structure and funding. Some recent reviews of such programs include the American Institutes for Research (1999), Northwest Regional Laboratory (2002), and Borman, Hewes, Overman, and Brown (2002).

This section contains brief descriptions of four models:

- First Things First (FTF)
- Comprehensive School Reform (CSR)
- National Literacy and Numeracy Strategies (NLNS)
- Alberta Initiative for School Improvement (AISI)

First Things First

First Things First (FTF) is a major comprehensive school reform that includes three central components: *small learning communities* of up to 350 students and their key teachers who remain together for several years; a *family advocate system*, in which each student is paired with a staff member who meets regularly with the student, monitors his or her progress, and works with the student's parents to promote success; and *instructional improvement efforts* aimed at making lessons more engaging and rigorous, as well as better aligned with state and local standards (Quint, Bloom, Black, & Stephens, 2005).

FTF was designed by the Institute for Research and Reform in Education (IRRE), headed by James P. Connell. The model is based on research and factors making for high engagement and high achievement among adolescents, literature on organizational change and effective educational practices, and experiences of schools that have succeeded with students who might otherwise be at high risk of school failure. Table 4.6 summarizes its critical features.

FTF was first launched in Kansas City. District planning began in 1996 with officials deciding to adopt the initiative and phase it in over several years. The first school planning began during the 1997-1998 school year with implementation in the following year. A second high school-middle school cluster began planning in 1998-1999 with implementation in 1999-2000. The two remaining clusters began planning in 1999-2000 and implementation in 2000-2001.

IRRE subsequently sought to test the initiative through the Scaling UP First Things First Demonstration, a collaboration between IRRE and MDRC[24], which has provided oversight and studies the program's implementation and impacts at the expansion sites that are part of the scaling-up effort. The four expansion districts are the Houston (Texas) Independent School District, the Riverview Gardens (Missouri) School District, and Greenville and Shaw School Districts in Mississippi. The new sites comprise secondary schools in a variety of urban, suburban, and rural settings.

The impacts of FTF were measured using a comparative interrupted time-series design. Middle and high school students in Kansas City registered large gains on a range of academic outcomes that were sustained over several years and were pervasive in the district's schools; improvements occurred over eight years. It is not yet clear if the expansion sites, which had operated FTF for two or three years, will replicate the impressive findings for Kansas City.

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[24] MDRC is a nonprofit, nonpartisan social research agency.

Table 4.6: First Things First Critical Features

Changes	Characteristics
Structural	1. Lower student-adult ratios to 15:1 during language arts and math classes for at least 10 hours per week. 2. Keep the same group of 8-10 professionals with the same group of 150-350 students for extended periods during the school day for all three years of middle school and at least two years in high school.
Instructional	3. Set high, clear, and fair academic and conduct standards. 4. Provide enriched and diverse opportunities to learn, by making learning more active and connected in safe and respectful learning environments. 5. Equip, empower, and expect all staff to improve instruction by creating a shared vision and expectation of high-quality teaching and learning in all classrooms.
Accountability & Governance	6. Allow for flexible allocation of available resources by teams and schools, based on instructional and interpersonal needs of students. 7. Assure collective responsibility by providing collective incentives and consequences for small learning communities, schools, and central office staff that are linked to change in student performance.

Quint *et al.* (2005, p. 7) based on IRRE documents.

Data were collected on student outcomes for multiple pre-intervention baseline years, multiple post-intervention follow-up years, multiple FTF schools, and multiple comparison schools[25]. For Kansas City, student-level data were regression-adjusted for demographics (4 FTF high schools and 7 comparison schools; 8 FTF middle schools and 9 comparison schools). For Houston, student-level data were regression-adjusted for demographics and pretest (3 FTF high schools and 10 to 11 comparison schools; 4 FTF middle schools and 3 to 15 comparison schools). Data were collected for three baseline years and three years (Years 1, 2, 3) follow-up (p. 68).

Leadership and technical assistance in Kansas City consists of consistent support from the superintendent and other central office leaders from FTF's inception. District staff provides both support and pressure for effective implementation at FTF schools, overcomes district- and school-level resistance, and launches major initiative to improve instruction. Technical assistance is provided by key IRRE personnel who visit the site at least bi-monthly to advise and provide a sounding board for district leadership, monitor implementation, maintain clarity of vision, and push for continuous progress.

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[25] Multiple baseline years help to provide a reliable benchmark of pre-intervention outcomes by averaging random year-to-year fluctuations in student outcomes. Multiple follow-up years help to provide the elapsed time needed for a reform to be implemented and thus to begin to take effect. Multiple schools help to provide a reliable measure of change over time in the presence of the reform. This reliability stems from (1) the ability of multi-school averages to reduce random year-to-year fluctuations in student outcomes and (2) their ability to "dampen the shocks" that can occur at a single school to idiosyncratic local events, such as a change in principal. For the same reasons, multiple comparison schools can help to provide a reliable basis for estimating the change over time in student outcomes that would have occurred without the reform (Quint *et al.*, 2005, p. 66).

Comprehensive School Reform

In the United States, Comprehensive School Reform (CSR) is a federally funded program that encourages schools to marshal their resources into a single, schoolwide, "comprehensive" reform program rather than engage in fragmented improvement initiatives. The initiative began in 1998 with a $145 million Congressional appropriation, and over the past five years more than 5,000 schools have received funds. Under the program, each school received a grant of at least $50,000 a year renewable for up to three years. The program aims to raise student achievement by requiring schools to integrate 11 federally identified components of reform identified in the *No Child Left Behind Act*. In the first of a five-year, longitudinal study of the CSR program, Tushnet, Flaherty, and Smith (2004) found that CSR schools were more likely than non-CSR schools to adopt whole-school reform models, offer professional development, and use research-based improvement strategies.

National Literacy and Numeracy Strategies

In England, the National Literacy and National Numeracy Strategies were an extension of the education reform movement that began in the 1980s in England. The strategies resulted from a concern that schools were deficient in the basics which are fundamental to improving student learning. The National Literacy Strategy (NLS) was implemented in 1998 and the National Numeracy Strategy (NNS) in 1999. The national strategies aimed to increase the performance[26] of 11-year-old students to 80% in literacy and 75% in numeracy by 2002 (Key Stage 2 national assessments at the required standard of level 4 performance). The strategies were part of a lot of other school improvement policies and additional school spending.

The strategies included a National Literacy Office with 12 regional offices, with the same for Numeracy; over 600 literacy and numeracy coordinators at the LEA (district) level with half the costs covered by the national government; an explicit focus on changing teaching practices linked to increasing student learning; a daily literacy hour and mathematics lesson based on recommended teaching practices; the development of high-quality curriculum materials, resource documents, and videos depicting good practice; a massive training and capacity building "cascade" model; allocation of significant new financial resources; strengthened pressure and support infrastructure, and an independent external assessment of the strategies over a four-year period from 1998 to 2002 (Fullan, 1999).

The Ontario Institute for Studies in Education at the University of Toronto (OISE/UT) was commissioned to undertake an independent external evaluation of the implementation of the strategies in 1998. The first evaluation report, *Watching & Learning 1* was released in January 2000 and the second report was released in September 2001. The final report, *Watching & Learning 3*, was released in 2003 (Earl, Watson, Levin, Leithwood, & Fullan, 2003). The OISE/UT evaluation team acted as a critical friend to the Department for Education and Skills (DfES) and other key partners by describing the strategies from different perspectives, drawing connections between the international research literature on large-scale reform and the national strategies, and identifying issues for attention.

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[26] The baseline was established in 1996 in which 57% (literacy) and 54% (numeracy) of all 11-year-olds in England were achieving level 4 or 5 on the national tests (Barber, 2000).

While there was impressive improvement in both literacy and numeracy, the established targets were not fully met. The evaluators identified a number of successes and challenges and concluded that there had been indications of improved teacher practice and student learning, and that the commitment to collective capacity building is the most promising direction for addressing challenges of the future (Earl *et al.*, 2003).

The Alberta Initiative for School Improvement

The Alberta Initiative for School Improvement (AISI) was introduced in 1999 with the first year of implementation in the 2000-2001 school year. AISI is an extension of Alberta's accountability framework that has been in place since the early 1990s. The goal of this program is to improve student learning and performance by fostering initiatives that reflect the unique needs and circumstances of each school authority. During Cycles 1 (2000-2003) and 2 (2003-2006) of AISI, Government invested $400 million in more than 1,300 locally developed projects. Budget 2006 announced a third three-year cycle extending the initiative to 2009.

The AISI approach to improving student learning is through partnerships and collaboration in a culture of continuous improvement, inquiry and reflection. AISI encourages creativity and innovation in enhancing strategies to improve student learning based upon local needs. The AISI partners[27] provide leadership and work collaboratively so that the initiative fulfils its potential. School authorities (collaborating with their school communities and prioritizing local needs) decide which areas of student learning and performance need attention, how to go about improving these areas (e.g., new teaching strategies, student support), and how to provide evidence that improvement has taken place (measuring student performance).

All school authorities (public, separate, francophone, charter, and private) participate in AISI. During the first two cycles, school authorities developed and implemented more than 1,300 projects to address diverse local needs; they are responsible for collecting, analyzing and reporting results. The provincial government funds all approved project proposals[28], provides a number of supports to project teams, approves annual project reports, and analyzes and reports overall results.

The School Improvement Branch (SIB) of Alberta Education is responsible for providing leadership in the development and implementation of AISI. SIB provides the following supports.

- Online Database System – This secure online system is a single-interface, seamless service. It consists of two secure components: the extranet for school authorities to create and submit their project plans and reports to SIB, while the intranet component allows SIB staff to receive, review, extract and approve project plans and reports. This flexible system allows SIB staff and AISI coordinators to work together to update projects online. The online system allows

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[27] Alberta Education, Alberta Home and School Councils' Association (AHSCA), Alberta School Boards Association (ASBA), Alberta Teachers' Association (ATA), Association of School Business Officials of Alberta (ASBOA), College of Alberta School Superintendents (CASS), Universities (Alberta, Calgary, Lethbridge).

[28] Requirements for project proposals include school community involvement; literature and research; improvement goal(s); support of implementers; measures, baseline(s) and improvement targets; strategies; evaluation methods and data sources; and ongoing administrative support.

SIB to aggregate data from project reports to generate provincial statistics. The system's management capacity can generate a variety of financial and administrative reports. The system also supports searching on various parameters to produce a variety of analytic reports, the major one being the annual provincial report.

- Workshops – Regular communication with project participants serves to develop a shared understanding of the scope, objectives and accountabilities of AISI. Generally, workshops have three main objectives: discussion of a key topic (such as roles, project management, measurement, sustainability) relevant to coordinators at a particular point in time, opportunities to network and meet other coordinators, and opportunities to share information.

- Conferences – The major purpose of the annual conference is to showcase AISI projects and build capacity for the Alberta learning system to effectively implement school improvement through fostering extensive sharing. More than 3,100 people (teachers, administrators, trustees, and parents) participated in the first five conferences.

- AISI Website – The AISI website is dynamic and interactive. It contains all information regarding the initiative including documents and publications. It also contains all approved project plans and reports, as well as the products, tools, and promising practices that project teams have developed. It is available at http://www.education.gov.ab.ca/k_12/special/aisi/

- Local Consultation – SIB managers work with AISI coordinators on a one-on-one basis, providing assistance tailored to meet local needs.

Table 4.7 summarizes the lessons learned during Cycle 1 of AISI (Alberta Learning, 2004). The lessons are organized into three sections: student learning, professional practice, and support and infrastructure.

Table 4.7: Summary of Lessons for Students, Educators, and Support and Infrastructure

Student Learning	Professional Practice	Support and Infrastructure
Focus on learning	Enhanced teacher capacity	Funding
Impact on achievement	Teachers as researchers	Administration and time
Impact on satisfaction	Leadership	Measurement
Differential effects	Relationships	Sharing and dissemination
		AISI partnership

Synopsis

The research traditions of school effectiveness and school improvement have different origins and intentions. School effectiveness explores what works and why while school improvement is practice and policy oriented and intended to change education in the desired direction. Today the two traditions are usually merged.

Large-scale improvement initiatives work. The body of evidence suggests that there are many effective approaches. This section has featured four approaches – the American models First Things First and Comprehensive School Reform, the English National Literacy and Numeracy Strategies and the Alberta Initiative for School Improvement because of their scope and diverse approaches to improving student learning and performance.

Data from multiple methods and sources increase confidence in the validity of findings. Performance-based evidence about the effectiveness and efficiency of reform initiatives can inform decisions about policy and practice. Although issues are inevitable, they can be managed through the use of strategies

Table 4.8: Implementation Issues and Strategies

Issues	**Aspects**	**Strategies**
People	leadership will capacity commitment	leaders at all levels top down & bottom up voluntary participation culture of collaboration professional development choice of strategies
Infrastructure	time support positive climate resources	release time for staff coordinators/lead teachers communication celebration of milestones financial, physical, material
Evidence of Success	measurement tools number of measures points of reference interpretation value for money	valid and reliable instruments points of reference (time, groups, targets) baseline, targets, results multi-level perspectives longitudinal study multiple data sources effect sizes triangulation caution regarding attribution of project effects ongoing professional development documentation and reporting cost-benefit analyses
Sustainability	continuous improvement manageability institutionalization	leadership at all levels system-wide implementation adequate resources and support parental involvement preservice teacher training
Unintended Effects	staff burnout undesirable consequences effects on other areas long term effects	ongoing monitoring and evaluation opportunity costs

McEwen (2002, p. 15).

that have been found to be effective. Making information widely available contributes to the body of knowledge on how to improve teaching and learning. Table 4.8 summarizes implementation issues based on a comparison of the English and Alberta programs.

The completion of AISI Cycle 1 led to a number of recommendations for school authorities, schools, universities, parents, education partners, and government during Cycle 2. These recommendations include continuing to focus on student learning, integrating what was learned and sharing promising practices, continuing to build professional capacity, collaborative planning including a greater role for parents, in-depth analysis of AISI findings, using AISI evidence to inform decision making, and continuing to fund the initiative (Alberta Learning, 2004). These recommendations are likely applicable to other large-scale improvement initiatives.

5 STRATEGIES

School improvement focuses on improving both the quality and equity of student learning by fostering enhanced strategies at the school, district, and government levels. Areas essential to promote school improvement include leadership, instructional practice, school climate, data-driven decisions through assessment and accountability, building capacity through professional development, student and parent engagement, and sustainability. This chapter includes strategies identified in the school effectiveness and school improvement literature.

5.1 Leadership

Leadership occurs at all levels: government, school districts, schools, and by all partners in education: administrators, principals, teachers, students, parents. There are various conceptualizations of leadership. Theories of leadership include transformational and transactional leadership, total quality management, servant leadership, situational leadership, and instructional leadership. Prominent theorists include Warren Bennis, Peter Block, Marcus Buckingham and Donald Clifton, James Collins, Stephen Covey, Richard Elmore, Michael Fullan, Ronald Heifetz and Marty Linsky, and James Spillane.

Types

Table 5.1 summarizes five domains providing major proponents, exemplars of each domain, the mind set, and beliefs.

Covey (2004) wrote a sequel to his highly successful *7 Habits*[29] *of* books. The 7 habits are character principles that shape who and what we are. In the 2004 book, he introduces an 8th habit that is a third dimension to the 7 habits that meets the central challenge of the new knowledge worker age – to find your voice and inspire others to find theirs (p. 5). Voice is unique personal significance and lies at the nexus of talent, passion, need, and conscience.

The 8th habit is the pathway to greatness, which lies in finding your own voice and inspiring others to find theirs. It is also called the sweet spot, which is the nexus where the three circles of greatness overlap. Personal greatness is found as we discover choice, principles, and the four human intelligences (mental, physical, emotional, and spiritual) which lead to a character full of vision, discipline, passion, and conscience. Leadership greatness is achieved by people who choose to inspire others to find their voice, which is achieved through living the four roles of leadership: modeling, pathfinding, aligning, and empowering. Organizational greatness is

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[29] The 7 habits are: (1) be proactive, (2) begin with the end in mind, (3) put first things first, (4) think win-win, (5) seek first to understand, then to be understood, (6) synergize, (7) sharpen the saw.

Table 5.1: Conditions for Implementing Effective Change

Domain	Guru	Exemplar	Mind Set	Change Belief
Authentic	Stephen Covey	Mahatma Gandhi	It is only when one has become an authentic, value-driven person that he or she is able to morally and effectively lead others.	Change happens when there is a compelling reason to change.
Visionary	Warren Bennis	Walt Disney	Vision and leadership are synonymous. If you're not a visionary, at best, you're a manager.	Change happens when people are able to see a concrete picture of the future.
Cultural	Terry Deal	Red Auerbach & Boston Celtics	Organizational culture is the critical variable in the long-term success of organizations.	Change happens from the inside out when individuals are involved in, and thereby become committed to, the change.
Quality	W. Edwards Deming	Marvin Runyon	High-quality products and services are no longer a market advantage but an entrance requirement.	Change happens when individuals and teams have the capacity to implement the vision.
Service	Robert Greenleaf	Mother Theresa	People are our most important resource, and they'll do the "right thing right" if they get support.	Change happens, and is sustained, when people are supported in making the change.

Note. From *Total Leaders* by Schwahn and Spady, 1998 (pages 34, 50, 66, 84, 102).
Source: Byers & Sloan (2000, p. 21*)*.

achieved as the organization translates its leadership roles and work (including mission, vision, and values) into principles or drivers of execution: clarity, commitment, translation, enabling, synergy, and accountability (Covey, 2004, p. 279). Table 5.2 summarizes his principle-centered focus and execution of three types of greatness: personal, leadership, and organizational.

Table 5.2: Principle-Centered Focus and Execution

Personal Greatness	Leadership Greatness	Organizational Greatness
The 7 habits	*The 4 roles of leadership*	*Vision, Mission, Values*
Vision	Modeling (7H)	Clarity
Discipline	Pathfinding	Commitment
Passion	Aligning	Translation
Conscience	Empowering	Enabling
		Synergy
		Accountability

Adapted from Covey (2004, p. 280).

Responsibilities

Marzano, Waters, and McNulty (2005) conducted a meta-analysis of 69 studies[30] of the research on school leadership from 1978 to 2001 that met their selection criteria. They also conducted a factor analysis of a survey of more than 650 principals to explore the relationship between leadership and student achievement. They developed a list of 21 leadership responsibilities that have a significant effect on student achievement. Their meta-analysis found the correlation between the leadership behavior of the school principal and average student academic achievement in the school to be 0.25 (p. 10).

Table 5.3 presents the correlations between 21 leadership responsibilities and student academic achievement. The relationship was strongest for situational awareness, flexibility, discipline, monitoring/evaluating, and outreach.

Table 5.3: Leadership Responsibilities and Their Correlations with Student Achievement

Responsibility	The extent to which the principal:	Average Correlation	Number of Studies
1. Affirmation	Recognizes and celebrates accomplishments and acknowledges failures	.19	6
2. Change Agent	Is willing to challenge and actively challenges the status quo	.25	6
3. Contingent Rewards	Recognizes and rewards individual accomplishments	.24	9
4. Communication	Establishes strong lines of communication with and among teachers and students	.23	11
5. Culture	Fosters shared beliefs and a sense of community and cooperation	.25	15

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[30] The 69 studies included in the meta-analysis involved 2,802 schools, approximately 1.4 million students, and 14,000 teachers (Marzano, Waters, & McNulty, 2005, p. 10).

Responsibility	The extent to which the principal:	Average Correlation	Number of Studies
6. Discipline	Protects teachers from issues and influences that would detract from their teaching time or focus	.27	12
7. Flexibility	Adapts leadership behavior to the needs of the current situation and is comfortable with dissent	.28	6
8. Focus	Establishes clear goals and keeps those goals in the forefront of the school's attention	.24	44
9. Ideals/ Beliefs	Communicates and operates from strong ideals and beliefs about schooling	.22	7
10. Input	Involves teachers in the design and implementation of important decisions and policies	.25	16
11. Intellectual Stimulation	Ensures faculty and staff are aware of the most current theories and practices and makes the discussion of these a regular aspect of the school's culture	.24	4
12. Involvement in Curriculum, Instruction, and Assessment (CIA)	Is directly involved in the design and implementation of curriculum, instruction, and assessment practices	.20	23
13. Knowledge of CIA	Is knowledgeable about current curriculum, instruction, and assessment practices	.25	10
14. Monitoring/ Evaluating	Monitors the effectiveness of school practices and their impact on student learning	.27	31
15. Optimizer	Inspires and leads new and challenging innovations	.20	17
16. Order	Establishes a set of standard operating procedures and routines	.25	17
17. Outreach	Is an advocate and spokesperson for the school to all stakeholders	.27	14
18. Relationships	Demonstrates an awareness of the personal aspects of teachers and staff	.18	11
19. Resources	Provides teachers with materials and professional development necessary for the successful execution of their jobs	.25	17
20. Situational Awareness	Is aware of the details and undercurrents in the running of the school and uses this information to address current and potential problems	.33	5
21. Visibility	Has quality contact and interactions with teachers and students	.20	13

Marzano, Waters, & McNulty (2005, pp. 42-43).

Fullan has written extensively about transforming leadership in school systems. In 2003, he recommended the following:

1. Reconceptualize the role of school leadership
2. Recognize and work with the continuum of development
3. Get school size right
4. Invest in leaders developing leaders
5. Improve the teaching profession
6. Improve the capacity of the infrastructure (p. 73)

Figure 5.1: The New Role of the Principal – Level 5 Leadership

In reconceptualizing the role of school leadership, the new role of the principal is closer in conception to that of the chief operating officer. That is, identical to Collins[31] (2001) **Level 5: Executive** – Builds enduring greatness through a paradoxical blend of personal humility and professional will.

- First who … then what – get the right people first
- Confront the brutal facts (yet never lose faith)
- The hedgehog concept (simplicity within the three circles: passion, competence, commitment)
- A culture of discipline:

When you have:	**Don't need:**
Disciplined people	Hierarchy
Disciplined thought	Bureaucracy
Disciplined action	Excessive controls

- Technology accelerators – application of carefully selected technology

Teachers should be immersed in disciplined, informed professional inquiry and action that results in raising the bar and closing the gap by engaging all students in learning (p. 11).

Adapted from Fullan (2003).

DuFour (2002) stated that schools need principal leadership as much as ever. But only principals who understand that the essence of their job is promoting student and teacher learning are able to provide that leadership. By concentrating on learning, today's school leaders shift both their own focus and that of the school community from inputs to outcomes and from intentions to results. More succinctly, teachers and students benefit when principals function as learning leaders rather than instructional leaders.

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[31] Collins (2001) five levels are: (1) highly capable individual, (2) contributing team member, (3) competent manager, (4) effective leader, (5) executive (p. 20).

When principals focus on creating a collaborative professional learning community, they help teachers to address the fundamental need to make a positive difference in the lives of their students.

Principals should strive to create in their schools the collaborative culture of a professional learning community in which they must do more than encourage teachers to work together. Specifically principals must:

- provide time for collaboration in the school day and school year
- identify critical questions that guides the work of collaborative teams
- ask teams to create products as a result of their collaboration
- insist teams identify and pursue specific student achievement goals
- provide teams with relevant data and information (DuFour, 2000)

It is no longer sufficient to offer a collection of professional development experiences for a staff. Principals who function as staff development leaders recognize that PD is a means to an end – improved student achievement. This emphasis also means building the school's collective capacity to achieve school-wide goals.

Guppy, Crocker, Davies, LaPointe, and Sackney (2005) conducted a methodologically rigorous survey[32] of Canadian parents and teachers to help inform public debate and the development of education policy. The report summarizes the findings from a national survey designed to allow comparisons between parents and teachers. As well, regional analyses and comparisons of subgroups are provided to highlight substantive differences (p. 11). Guppy *et al.* asked parents and teachers to indicate how the school principal creates a positive school climate. Table 5.4 presents the results. Both parents and teachers agreed that principals were effective school leaders.

Table 5.4: Canadian Parent and Teacher Views on the Role of the Principal

Is your principal:	**Parents** % Agreeing	**Teachers**
1. Creating a safe, caring, & respectful environment	89	84
2. Responding to my needs	79	79
3. Providing a sense of vision and purpose	79	77
4. Communicating to parents	76	82

Source: ACE National Survey, 2005.

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[32] A market research firm conducted telephone interviews, in both English and French, with representative samples of 2,191 teachers, and 2,008 parents from the provinces and territories (p. 13). Twenty focus groups with teachers and parents (167 participants) and a literature review on surveys and education reform and restructuring identified the following areas for questions: accountability, choice, parental involvement, roles and responsibilities of teachers' unions, school leadership, school safety and discipline, assessment, teacher evaluation and compensation, teacher training and professional development (p. 13). The report and data for the Analyzing Change in Education (ACE) National Survey are available at http://www.aceresearch.ca/index.html

5.2 Instructional Practices

Schools are responsible for providing effective instructional practices and environments to help students succeed. Performance-based reforms (also referred to as systemic or standards-based reform) include a vision and goals, standards, curriculum frameworks and related material, policy coherence and integration, performance information, finance and governance, and an agent for receiving information, and distributing rewards and sanctions (Leithwood, Jantzi, & Mascall, 1999).

Models and Performance

Effective schooling processes include effective leadership, teacher and teaching effectiveness, focusing on learning, a positive school culture, high expectations, emphasizing student responsibilities and rights, monitoring progress, staff development, and parental involvement (Reynolds & Teddlie, 2000). Figure 5.1 presents effective school processes.

Figure 5.2: Effective Schools Processes

1. leadership
2. teaching
3. focus on learning
4. positive school culture
5. high expectations for all
6. student responsibilities & rights
7. monitoring progress
8. staff development
9. parental involvement

Reynolds & Teddlie (2000, p. 144).

School improvement incorporates processes noted in Chapter 4. Incorporating what we know about these areas helps schools to become more effective.

Continuing challenges for performance-based reform include acknowledging the local context, the role of the school site, incentives that work, increasing professional capacity, and diagnosing and addressing opportunity costs (Leithwood, Jantzi, & Mascall, 1999).

Any innovation or reform requires people to implement it. Will, capacity, and situation are key variables in a model of employee performance (Rowan, 1996). According to this model, performance is a function of employee motivation and ability, and the situation in which the employee performs his or her work. Relationships among the variables are assumed to be multiplicative. Figure 5.3 presents one model of performance.

Figure 5.3: A Model of Performance

Performance $Pj = f(Mj, Aj, Sj)$

will	motivation
capacity	ability
situation	situation

Leithwood, Jantzi, & Mascall (1999, p. 7)

Herman and Stringfield (1997) reviewed ten promising programs and concluded that implementation is an enormous challenge, varies greatly among different sites, and requires a supportive environment as programs continue to evolve. In identifying a number of challenges, they noted there remains ample room for instructional improvements, even in schools nominated as providing exemplary services.

Instructional Strategies

There has long been a search for methods of group instruction as effective as one-to-one tutoring, which has an effect size of 2.00. Bloom (1984) called this the 2 sigma problem. Several researchers have investigated various approaches over the years. See Chapter 2.

Recently Marzano and his colleagues conducted meta-analyses to identify such strategies. The following instructional strategies have a high probability of enhancing student achievement for all students in all subject areas at all grade levels. Table. 5.5 presents the strategies.

Table 5.5: Instructional Strategies that Affect Student Achievement

Instructional Strategies	Average Effect Size	Percentile Gain
Identifying similarities and differences	1.61	45
Summarizing and note taking	1.00	34
Reinforcing effort and providing recognition	.80	29
Homework and practice	.77	28
Nonlinguistic representations	.75	27
Cooperative learning	.73	27
Setting objectives and providing feedback	.61	23
Generating and testing hypotheses	.61	22
Questions, cues, and advance organizers	.59	22

Marzano, Pickering, & Pollack (2001, p. 7).

Marzano elaborated on these strategies in subsequent books including Marzano, Norford, Paynter, Pickering, and Gaddy (2001). For example, *identifying similarities and differences* consists of comparing, classifying, creating metaphors and analogies. *Generating and testing hypotheses* includes systems analysis, problem solving, decision making, historical investigation, experimental inquiry, and invention.

Gijbels, Dochy, Van den Bossche, and Segers (2005) conducted a meta-analysis of problem-based learning (PBL) to investigate the influence of assessment on the reported effects of PBL. Most of the 40 studies reported assessment at the level of understanding of concepts[33] (N=31). The effect sizes were of practical significance: 0.34 for the assessment of the organization of the knowledge structure, and 0.80 when assessment addresses the linking of concepts and principles to application conditions and procedures. The study also found that the method of assessment has an important influence in the reported effects of PBL. Implications of assessment and the levels in knowledge structure being measured must be considered when examining the effects of PBL and probably should be considered in all comparative education research (pp. 46-47).

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[33] Three levels of knowledge structure were the main independent variables: (1) understanding of concepts, (2) understanding of principles that link concepts, and (3) linking concepts and principles to conditions and procedures for application. PBL had the most positive effects when the focal constructs assessed were at the level of understanding principles that link concepts (p. 27).

Meta-analysis is also used in the Alberta Initiative for School Improvement (AISI) to identify differential effects for groups of students, curricular areas, themes, and instructional strategies. Table 5.6 summarizes AISI effects on student achievement and satisfaction during Cycle 1. Students who were at risk or had mild/moderate needs showed greater improvement (0.30 and 0.28 respectively) on student achievement than those in regular (0.23) or gifted (0.10) programs. Science projects demonstrated the largest effects (0.35) followed by early literacy (0.30). Early intervention projects had the largest effects (0.43) followed by transitions to high school (0.34) and high school completion (0.31) projects. The most effective instructional strategies were reading with parents at home (0.38), technology integration (0.36), small groups (0.34), counselling (0.33), and peer assistance (0.30). AISI had a greater impact on satisfaction (students, parents, and teachers) than on student achievement, with moderate effects for most of the categories examined (Alberta Learning. AISI, 2004, p. ix).

Table 5.6: Summary of AISI Effects on Student Achievement and Satisfaction

Effect Size*	Student Groups	Selected Subjects	Selected Themes	Instructional Strategies
Student Achievement				
Medium (0.4-0.7)		• Science	• Early intervention	• Reading with parents at home • Technology integration
Small (0.2-0.3)	• At risk • Special needs • Regular	• Early literacy • Math • Fine arts	• Transition to high school • High school completion	• Small groups • Counselling • Peer assistance • Differentiation • Small class size
Minimal (Less than 0.2)	• Gifted		• School climate/ behavior	
Satisfaction (Students, Parents, Teachers)				
[illegible]				• [illegible]
Medium (0.4-0.7)	• At risk • Regular • Special needs	• Fine arts • Science • Math	• High school Completion • Transition to high school • School climate/ behavior	• Counselling • Technology integration • Reading with parents at home • Small class size • Differentiation • Small groups
Small (0.2-0.3)	• Gifted	• Early literacy	• Early intervention	
Minimal (Less than 0.2)				

*Effect sizes of 0.2 correspond to gains of about 8 percentile points, 0.4 of about 16 percentile points, and 0.7 of about 26 percentile points.

Alberta Learning. AISI (2004, p. 34).

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Minimal (Less than 0.2)	• Gifted		• School climate/ behavior	
Satisfaction (Students, Parents, Teachers)				
Large (0.8 +)				• Peer assistance
Medium (0.4-0.7)	• At risk • Regular • Special needs	• Fine arts • Science • Math	• High school Completion • Transition to high school • School climate/ behavior	• Counselling • Technology integration • Reading with parents at home • Small class size • Differentiation • Small groups
Small (0.2-0.3)	• Gifted	• Early literacy	• Early intervention	
Minimal (Less than 0.2)				

*Effect sizes of 0.2 correspond to gains of about 8 percentile points, 0.4 of about 16 percentile points, and 0.7 of about 26 percentile points.

Alberta Learning, AISI (2004, p. 34).

Another approach to identifying successful practices is the research synthesis. The Education Policy Studies Laboratory (EPSL) at Arizona State University invited a group of distinguished education scholars to review the research on a series of education reform topics. Molnar (2002) edited the collection of 13 chapters on school reform proposals[34]. Each chapter synthesizes the best information available at the time. Each presents evidence for the effectiveness of the reform proposals. The research evidence identifies those investments that promise the highest return. Taken together, the chapters constitute a comprehensive resource guide on the state of education reform and research into reform. Three of the chapters are featured here: instructional time, student grouping, and cognitive strategies.

Glass (2002b) reviewed the literature on instructional time and concluded that small marginal increases (10 to 15 percent) in time allocated to schooling show no appreciable gains in student achievement. Alternative calendars on which the typical 180 days of schooling are offered (e.g., year-round calendars) show no increased benefits for student learning over the traditional calendar. Summer programs for at-risk students are probably effective, although more research is needed. Within reason, the productivity of schools is not a matter of the time allocated to them as much as a matter of how they use the time they already have.

Glass (2002a) also reviewed the research on ability grouping and found few benefits and many risks. More able students make greater academic progress when separated and given an accelerated course of study. Less able students who are segregated are at risk of being taught an inferior curriculum and consigned to low tracks for their entire academic career. On the basis of the evidence, Glass recommends:

- Heterogeneous ability or achievement groups offer several advantages:
  - ♦ less able students are at reduced risk of being stigmatized and exposed to a lower level curriculum
  - ♦ teachers' expectations for all students are maintained at higher levels
  - ♦ opportunities for more able students to assist less able peers in learning can be realized
- Teachers asked to teach in "de-tracked" schools require training, materials and support
- Administrators seeking to "de-track" existing programs require help in navigating the political course that lies ahead Glass (2002a, p. 47)

Rosenshine (2002) found that the past 30 years have seen major advances in research on cognitive processing and helping students learn and apply cognitive strategies in their learning. The research on cognitive processing underlies a major goal of education – helping students develop well-organized knowledge structures. Strategies that have been found that consistently help students effectively acquire strong knowledge structures include:

- Presenting new material in small steps so that working memory does not become overloaded
- Helping students develop an organization for new material

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[34] The 13 chapters address: (1) early childhood education, (2) class-size reduction in K-3, (3) small schools, (4) time for school, (5) grouping students for instruction, (6) parental and family involvement, (7) public schools and their communities, (8) teacher characteristics, (9) converging findings on classroom instruction, (10) teacher unions and student achievement, (11) value-added assessment of teachers, (12) professional development, (13) charter schools, vouchers, and Educational Management Organizations (EMOs).

- Guiding student practice by supporting students during initial practice, and providing for extensive student processing
- When teaching higher-level tasks, supporting students by providing them with cognitive strategies
- Helping students learn to use cognitive strategies by providing them with procedural prompts and modeling the use of these prompts
- Providing for extensive student practice (Rosenshine, 2002, p. 91)

Differentiation

While differentiation is beyond the scope of this report, some comments are germane to the discussion. There are essentially four ways to differentiate instruction: content, process, product or environment[35].

- Content – The knowledge, skills, and attitudes we want children to learn. Pre-testing students allows content to be provided according to students' previous performance (e.g., acceleration, remediation, independent study).
- Process – Varying learning activities or strategies for students to explore concepts. Alternative paths allow manipulation of ideas within the content (e.g., graphic organizers, maps, diagrams, charts).
- Product – Varying the complexity so students can demonstrate mastery of concepts. Choice of product can motivate students.
- Environment – Manipulating the environment or accommodating individual differences can be accomplished through learning styles, teaching strategies, and multiple intelligences. Each is discussed briefly in turn.

Learning Styles, Modalities, and Strategies – There has been a great deal of work in this area over the past two decades. These can be classified as sensory, perceptual, cognitive information processing, personality, personal talents, and situational.

Learning Strategies include inquiry, constructivism, cooperative learning, collaborative learning, engaged learning, developing intrinsic motivation, multiple intelligences, and study guides and strategies.

Instructional Design includes differentiation, problem-based learning, experiential learning, independent study, direct instruction, indirect instruction, interactive instruction, and technology.

Multiple Intelligences include linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, naturalist.

Examples of materials that have been developed for specific types of students include *The Journey* for gifted and talented students (Alberta Learning, 2004b) and *Our Words, Our Ways* for First Nations, Métis and Inuit learners (Alberta Education, 2005c).

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[35] A detailed discussion, together with references, is available at http://www.enhancelearning.ca

5.3 School Climate

As noted in Figure 5.3, performance is a function of motivation (will), capacity (ability) and the situation. The way people feel about where they learn and work has a powerful impact on how hard they work. Climate drives performance because it is tied to motivation or the energy they are willing to put into any endeavor.

Dimensions of Climate

Stringer and his colleagues have been examining the relationship between leadership and organizational climate for more than 30 years. He defined climate as the collection and pattern of environmental determinants of aroused motivation and identified six major dimensions of climate:

1. Structure – Clarity and organization of roles
2. Standards – The feeling of pressure to improve performance
3. Responsibility – Feeling encouraged to solve problems on your own
4. Recognition – Feelings of being appreciated and rewarded for a job well done
5. Support – Feelings of trust and mutual support within the organization
6. Commitment – Sense of pride on belonging to the organization (Stringer, 2002, pp. 10-11)

Determinants of climate include the external environment, strategies, leadership practices, organizational arrangements, and historical forces. Different climates arouse different kinds of motivation and stimulate different kinds of behavior. By changing how an organization is managed, it is possible to change the climate, which can change the direction and persistence of people's energy and have a profound impact on the organization's performance (p. 14).

> Leaders who know how to create and sustain high-performing climates and who know how to make the most of the organization's motivational capital are the leaders who will have the greatest personal impact. Like the impact of particles in a cloud chamber, it is normally unseen, but it is very real and very powerful. (Stringer, 2002, p. 225)

Trust is essential for developing a positive school climate. Leaders must develop and reinforce trust (Fullan, 2003). Table 5.7 summarizes the components of three types of trust: competence (capability), contractual (character), and communications (disclosure).

Table 5.7: Types of Trust

Competence Trust	Contractual Trust	Communication Trust
• Respect people's knowledge, skills, and abilities • Respect people's judgment • Involve others and seek input • Help people learn skills	• Manage expectations • Establish boundaries • Delegate appropriately • Encourage mutually serving intentions • Honor agreements • Be consistent	• Share information • Tell the truth • Admit mistakes • Give and receive constructive feedback • Maintain confidentiality • Speak with good purpose

Reina & Reina (1999, p. 100).

Inquiry-based learning can help schools develop a culture of inquiry. Guidelines for building a culture of inquiry include a clearly articulated vision for inquiry, administrator support, two or more champions to promote the vision, resources and space, teachers collaborating and supporting each other, small interdisciplinary teams of teachers working together, and problem solving and investigative skills are valued through the school/system (Alberta Learning, 2004a).

Student behavior and discipline can affect the classroom environment. Guppy *et al.* (2005) found that parents and teachers did not view student behavior and discipline to be a serious problem (12% and 20%, respectively), but both groups felt that discipline problems were increasing (25% and 39%, respectively). Table 5.8 presents their perceptions of factors contributing to classroom disruption. Both parents and teachers rated large class sizes as the most important factor (43% and 57%, respectively). Teachers rated all factors about 10% higher than did parents.

Table 5.8: Perceptions of Factors Contributing to Classroom Disruption

	Parents	**Teachers**
Factors contributing to classroom disruption:	% Great Extent	
1. large class sizes	43	57
2. parents' failure to instill acceptable standards of behavior	36	49
3. One or a few problem students	33	46
4. Too great a mix of special needs students	29	43
5. Too great a mix of academic abilities	23	32

Source: ACE National Survey, 2005.

Reculturing Schools

Three contemporary approaches to reculturing schools are articulated by Brendtro, Brokenleg, and Van Bockern (2002), Hulley and Dier (2005), and Zmuda, Kuklis, and Kline (2004).

Using the medicine wheel philosophy to portray the four universal human needs, Brendtro, Brokenleg, and Van Bockern (2002) discuss the Circle of Courage, a model of youth empowerment using the four core values of belonging, mastery, independence, and generosity.

- Belonging – The universal longing for human bonds is cultivated by relationships of trust so the child can say, "I am loved."
- Mastery – The inborn thirst for learning is cultivated; by learning to cope with the world, the child can cay, "I can succeed."
- Independence – Free will is cultivated by responsibility, so the child can say, "I have the power to make decisions."
- Generosity – Character is cultivated by concern for others so the child can say, "I have a purpose for my life." (pp. 137-138)

Positive relationships between adults and youth are the foundation of successful programs of education, group care, and treatment. Synergistic relationships include peer-group relationships, sta teamwork, relationships with parents, and leadership relationships. A resilient youth is one who:

- builds bonds with adults and peers based on care and mutual concern
- thinks for him- or herself and can solve problems creatively
- can tolerate frustration and manage emotions
- avoids making other people's programs one's own
- shows optimism and persistence in the face of failure
- resists being put down and sheds negative labels
- has a sense of humor and can "forgive and forget" (Brendtro, Brokenleg, & Van Bockern, 2002, p. 106).

Another approach views schools as Harbors of Hope (Hulley & Dier, 2005). Based on the effective schools research, these schools share a number of attributes identified through survey and interview data: as student achievement improves, staff, students, and parents become more positive; students feel more attached to their teachers and the school; teachers express greater professional satisfaction; and parents show an increased level of support for schools and for education (p. 55).

Altering a school culture to create a Harbor of Hope is not easy. It involves changing timetables, modifying assessment strategies, introducing professional learning communities, teaching for success, using critical evidence to guide planning, and taking responsibility for results (p. 56). Table 5.9 summarizes how professional learning communities (PLCs) can shift school culture.

Table 5.9: Shifting School Culture Through PLCs

From		To
Teaching		Learning
Teacher isolation		Collaboration
Pass/fail mindset		Elimination of failure
Compliance		Commitment
Curriculum overload		Guaranteed curriculum
General goals	▶	Specific goals
Static assessment		Dynamic assessment
Over-the-wall grade promotions		Flexible structures
Planning to plan		Planning to improve
Time and staff fixed		Learning fixed
Learning for most		Learning for all

Hulley & Dier (2005, p. 108).

Zmuda, Kuklis, and Kline (2004) discuss transforming schools through creating a culture of continuous improvement. They advocate that change efforts must be personalized to fit the local context. They begin by posing the essential question: If we know better, why don't we do better? They offer two operating principles for staff development:

1. For staff development to be effective, it must be an integral part of a deliberately developed continuous improvement effort.
2. In a competent system, all staff members believe that what they have collectively agreed to do is challenging, possible, and worthy of the attempt (p. 5).

Transcending the status quo of isolation and moving to a competent system requires a continuous improvement plan composed of six steps for purposeful, systemic staff development.

1. Core beliefs – Identify and clarify the core beliefs that define the school's culture.

2. Shared vision – Create a shared vision by explicitly defining what these core beliefs look like in practice.

3. Use data to identify gaps – Collect accurate, detailed data, and analyze the data to define where the school is now and to determine gaps between the current reality and the shared vision.

4. Identify innovation(s) that will most likely close the gaps between the reality and vision.

5. Action plan – Develop and implement an action plan that supports teachers through the change process and integrates the innovation within each classroom and throughout the school.
6. Collective autonomy and accountability – Embrace collective autonomy as the only way to close the gaps between reality and vision, and embrace collective accountability in establishing responsibility for closing the gap (p. 6).

In advocating systems thinking as the door to continuous improvement, the essential question is "what is a competent system?" The operating principles follow:
1. Each school is a complex living system with purpose.
2. A competent system is driven by systems thinking.
3. Every staff member must be regarded as a trusted colleague in the examination of assumptions and habitual practices (p. 30).

5.4 Data Driven Decisions

Decisions are informed when they are based on sound data. This is also called evidence based decision making. Accountability is a means of providing evidence to inform decision making.

Literacy

Evaluation of information is a key element in three types of inter-related literacies: information literacy, statistical literacy, and data literacy. Table 5.10 presents the types of literacy in reverse order. Initially, one must access, assess, manipulate, summarize, and present data. Then analyze, interpret, and evaluate statistics to provide evidence. Finally, one must think critically about concepts, claims, and arguments, and read, interpret and evaluate information. Information can be used to generate knowledge which ultimately may lead to wisdom.

Table 5.10: Information, Statistical and Data Literacy

Type of Literacy	Description	A literate person is able to:
Information	Recognition of when information is needed and the ability to locate, evaluate, and use effectively the needed information.	• think critically about concepts, claims, and arguments • read, interpret and evaluate information
Statistical *There are lies, damned lies and statistics.**	The use of statistics as evidence in arguments. Statistics summarize data. They are socially constructed. Key elements: 1. How statistics are defined, selected and presented 2. Importance of context and confounding	• think critically about basic descriptive statistics • analyze, interpret, and evaluate statistics as evidence
Data	How to obtain and manipulate data. An essential component of both information and statistical literacy.	• access, assess, manipulate, summarize, and present data

Adapted from Schield (2004). Schield searched ERIC and found 1,498 citations for 'information literacy' and less than 65 citations each for 'quantitative', 'statistical' and 'data' literacy.

* Benjamin Disraeli, popularized by Mark Twain.

Data can be provided through a variety of approaches including assessment instruments, surveys, administrative records, and observation. Some of the most common ones follow.

• Assessment	standardized tests, norm/criterion-referenced tests, formative/summative tests, diagnostic tests, teacher tests

• Survey	surveys, interviews, focus groups
• Administrative	School records, provincial datasets
• Observation	Checklists, rubrics, etc.

Data are used to accurately and effectively access, analyze, and evaluate information, and communicate findings, conclusions, and recommendations. Some common tools for accessing, converting and manipulating data are:

- SQL – structured query language
- Relational databases (e.g., MS Access)
- Manipulation techniques (e.g., SPSS, STATA, Minitab, Excel)
- Presentation software (e.g., Excel, PowerPoint)

Four strategies for effective use of data include a supportive school climate, time for assessment, teacher training, and stating performance expectations. Table 5.11 elaborates the strategies.

Table 5.11: Strategies for Effective Use of Data

Supportive School Climate	Teacher beliefs
	Learning, assessment, and grading communication
	Priorities
	Continuous and reflective use of data
	Leadership
Time for Assessment	Recognition of assessment as part of instruction
	Synergistic and practical system
	Collection, storage, management, and communication of student achievement
	Professional collaboration
Teacher Training	Assessment literacy
	Reading and understanding test results
	Coaching and mentoring
Stating Performance Expectations	Standards
	Shared understanding
	Community involvement

Jandris (2002).

The Using Data Project, funded by the American National Science Foundation, helps math and science educators develop data literacy – the ability to examine multiple measures and multiple levels of data, to consider the research, and to draw sound inferences (Love, 2004, p. 22). The aim is to influence school culture to be one in which educators use data continuously, collaboratively and effectively to improve teaching math and science. Once data facilitators return to their schools, their job is to foster collaboration, build data teams, and facilitate conversations about data. This project has found a shift in the use of data as described in Table 5.12.

Table 5.12: Data Shifts

Less Emphasis		More Emphasis
External accountability		Internal and collective responsibility
Premature data-driven decision making		Ongoing data-driven dialogue
Data use as specialty of a few		Widespread data use and literacy
Data as carrot and stick	▶	Data as feedback for continuous improvement
Data in isolation		Data through collaborative inquiry
Data to sort		Data to serve

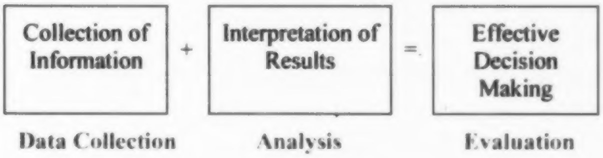
Love (2004, p. 24).

Evaluation

Evaluation is the systematic investigation of merit or worth[36].

Evaluation is a process in which information is used to make a judgment about the value or merit of something such as a program (e.g., new math or science) or activities (e.g., inquiry or collaborative learning). Figure 5.4 summarizes the process.

Figure 5.4: Evaluation Process


Collection of Information
+
Interpretation of Results
=
Effective Decision Making
Data Collection
Analysis
Evaluation

Taylor & Tubianosa (2001, p. 7).

Good evaluations provide information that is sound, meaningful, and sufficiently reliable to use in making thoughtful and responsible decisions (Guskey, 2000, p. 41). Table 5.13 summarizes several evaluation models that have been used extensively in education.

Table 5.13: Common Evaluation Models in Education

Evaluator	Date	Type
Tyler	1949	Clarification of a program or activity's goals.
Metfessel & Michael	1967	Extended Tyler's work by including multiple constituencies throughout the evaluation process and expanded the methods of data collection.

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[36] Guskey (2000, p. 41).

Table 5.13 continued

Evaluator	Date	Type
Hammond	1973	Further extension of Tyler to determine why goals are attained including a three-dimensional model: instruction (characteristics of the program or activity), institution (characteristics of individuals or groups), and behavior (cognitive, affective, psychomotor)
Scriven	1972	Goal-free evaluation model
Stuffelbeam	1969, 1971	**CIPP** –context, input, process, product – for making decisions: • context – to make planning decisions • input – structuring decisions • process – information for implementation decisions • product – focuses on outcomes
Kirkpatrick	1978	Four-level model to judge the quality, efficiency and effectiveness of programs: • reaction – how participants feel • learning – knowledge, skills and attitudes • behavior – how behavior changes • results – how processes have improved

Adapted from Guskey (2000).

Guskey (2000) identified 12 steps in a systemic evaluation process designed to yield reliable, meaningful, and useful results.

1. Clarify the intended goals.
2. Assess the value of the goals.
3. Analyze the context.
4. Estimate the program's potential to meet the goals.
5. Determine how the goals can be assessed.
6. Outline strategies for gathering evidence.

Gather and analyze evidence on:
7. participants' reactions
8. participants' learning
9. organizational support and change
10. participants' use of new knowledge and skills
11. student learning outcomes

12. Prepare and present evaluation reports (p. 272).

Evaluation is an ongoing, systemic process. It can be used for planning purposes and making formative and summative decisions. Evaluation should be informed by multiple approaches (methods, data sources, levels of analysis, and perspectives).

The program evaluation standards (Joint Committee, 1994) describe standards related to utility, feasibility, propriety, and accuracy. Guidelines and illustrative cases assist evaluators in meeting each of the 30 standards. This document identifies the most relevant of each of the types for deciding whether to evaluate, defining the problem, designing the evaluation, collecting and analyzing information, as well as reporting, budgeting, contracting, managing and staffing an evaluation.

Extended-term mixed method evaluation designs (ETMM) are effective in gathering evidence on what works in education. Formal study of contextual and site-specific variables with multiple research methods is a necessary prerequisite to designing sound field experiments for making generalized causal inferences (Chatterji, 2004, p. 3).

ETMM Characteristics

1. Use of a long-term research plan, deliberately tracking the course of a program or intervention over relevant parts of its life with formative and summative studies
2. Use of systemic, contextually-grounded studies in early phases followed by more sharpened, analytic experimental/quasi-experimental studies in later phases of the research
3. Deliberate study and documentation of environmental variables as a component of the research plan
4. Combined use of more than one research method, uncovering patterns and deepening understandings of relationships and causality
5. Explanation of causality based on both empirical and substantive knowledge gained on the program *and* its setting (p. 7)

ETMM designs permit better conclusions and recommendation on a program's effects. Prior to scaling up to larger multi-site implementation projects, program testing should occur in small numbers of carefully selected sites, with tightly conducted ETMM-type designs (p. 12).

Assessment

Assessment is a tool. It consists of the process of observing learning – describing, collecting, recording, scoring and interpreting information about learning. Assessment can be *of* learning (the most prevalent), *for* learning, and *as* learning.

Statements of principles and standards that should be reviewed in developing, collecting, scoring, interpreting, and reporting findings follow:

- *Principles for fair student assessment practices for education in Canada* (1993)

- *Code of professional responsibilities in educational assessment* (NCME[37], 1995)
- *Standards for educational and psychological testing* (AERA/APA[38]/NCME, 1999)

Like *The program evaluation standards*, these documents provide critical information for developers and users of assessment in developing and choosing methods, collecting assessment information, judging and scoring student performance, summarizing and interpreting results, and reporting assessment findings.

The Alberta Assessment Consortium (AAC)[39] is a not-for-profit equal partnership of education organizations dedicated to enhancing student learning through classroom assessments that both increase student confidence and enable them to effectively demonstrate what they know and can do.

A balanced model of assessment contains teacher-made tests, program assessments, standardized tests, and credentialing examinations (Taylor & Tubianosa, 2001). These authors recommend a balanced testing system, development of growth plans, a monitoring scheme, support mechanisms, a culture of collaboration, sharing experiences (to celebrate progress), and further research and investment (secondary analyses).

Common issues identified in the use of assessment include impact on the curriculum, emphasis on lower order thinking skills, test bias, unintended consequences, comparisons across schools, districts, states, or countries, potential misuse of results.

The benefits of assessment include focusing on learning, timely and accurate information that can be used for school improvement and accountability purposes, and a basis for targeted professional development.

Student learning can be measured in a variety of ways including assessments, surveys, and administrative data. Multiple measures are recommended in order to corroborate information from multiple sources (also called triangulation). Issues such as validity, reliability, and sampling need to be attended to in order to address the accuracy, representativeness, and validity of data collected about learning. A detailed discussion of these areas is beyond the scope of this report. Table 5.14 summarizes the domains, methods of assessing student learning outcomes, key indicators and reasons for multiple measures.

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[37] National Council on Measurement in Education.

[38] American Educational Research Association and American Psychological Association.

[39] AAC at http://www.aac.ab.ca AAC believes that all students can learn, all can learn excellently, and quality classroom assessment sows seeds for excellence. AAC currently consists of 71 jurisdictions including 53 Alberta school boards; all NWT education councils and boards; four Alberta universities and colleges; a public charter school of the Northwest Territories; the Alberta Teachers' Association and three international jurisdictions.

Table 5.14: Summary of Domains of Learning, Indicators, and Assessment

	Cognitive	Affective	Behavioral
Definition	knowledge and understanding	attitudes, beliefs, and dispositions	skills, behaviors, and practices
Sample Indicators	achievement high school completion	satisfaction attitudes	program participation fitness
Methods of Assessment	1. provincial achievement tests 2. diploma examinations 3. standardized achievement assessments 4. standardized performance assessments 5. teacher-developed classroom assessments 6. group tasks or activities 7. portfolios and other collections of students' work 8. grades or marks 9. questionnaires and interviews 10. school records	1. questionnaires 2. interviews	1. observations 2. questionnaires 3. interviews 4. school records
Assessment Issues	1. validity 2. reliability 3. sampling 4. multiple measures 5. disaggregation of the data 6. use of pre- and post-tests 7. use of comparison groups 8. timing	**Reasons for Multiple Measures** 1. Assessments of change or improvement require multiple measures. 2. Formative evaluations require assessments of interim and final goals. 3. Evaluations must consider intended and unintended outcomes. 4. Complex interactions among outcome measures necessitate the use of multiple measures.	

Note: See Guskey (2000) for a useful discussion.

Table 5.15 presents the purposes of assessment. There are three major types: classroom assessment for instructional purposes, assessments for instructional support, and those for policy use.

Table 5.15: Purposes, Users, Sample Questions, Needs, and Benefits of Assessment

Purpose	Type of Assessment	Users	Key Questions (Samples)	Information Needed	Benefits
Classroom/ Instruction	Day-to-day classroom	Student Teacher Parent	• Meeting standards? • Who needs help? • Is child succeeding?	Continuous	• Focus on learning • Timely, accurate information about achievement
Instructional Support	Standardized assessments	Principal Counselor Curriculum Director	• Is instruction producing results? • Who needs access to support? • Is program effective?	Periodic • Group • Individual	• Focus on learning • Staff development • Diagnostic info • Program evaluation
Policy	Standardized assessments	Superintendent School Board Ministry Citizen/ Legislator	• Are programs producing learning? • Are students learning?	Periodic • Group	• Program/ system evaluation • Accountability • Information that is accurate, understandable usable

Adapted from Jandris (2001, pp. 8-10).

The current literature discusses assessment *of*, *for* and *as* learning. Table 5.16 summarizes the features of the different approaches.

Table 5.16: Features of Assessment *of*, *for*, and *as* Learning

Approach	Purpose	Reference Points	Key Assessor
Assessment *of* Learning	Judgments about placement, promotion, credentials, etc.	Other students	Teacher
Assessment *for* Learning	Information for teachers' instructional decisions	External standards or expectations	Teacher
Assessment *as* Learning	Self-monitoring and self-correction or adjustment	Personal goals and external standards	Student

Earl (2003, p. 26).

The Assessment Reform Group (2002) defines assessment for learning as the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go, and how best to get there. This group has identified ten research-based principles of assessment for learning to guide classroom practice.

Assessment for learning
1. Is part of effective planning
2. Focuses on how students learn
3. Is central to classroom practice
4. Is a key professional skill
5. Is sensitive and constructive
6. Fosters motivation
7. Promotes understanding of goals and criteria
8. Helps learners know how to improve
9. Develops the capacity for self-assessment
10. Recognizes all educational achievement

Black and Wiliam (1998a; 1998b) found evidence from a synthesis of 250 articles or chapters that formative assessment is an essential component of classroom work and its development can raise standards of achievement. Their advice is summarized in Table 5.17. They conclude that there is no quick fix to improving teaching and learning, but a relatively slow process that takes place through sustained programs of professional development and support. The authors believe that it is the responsibility of governments to take the lead. Standards can be raised only by changes that are put into effect by teachers and students in classrooms.

Table 5.17: Ways to Improve Formative Assessments

Area	Evidence from the Research
Self-esteem of Students	Feedback to any student should be about the particular qualities of his or her work, with advice on what he or she can do to improve and should avoid comparisons with other students.
Self-assessment by Students	If formative assessment is to be productive, students should be trained in self-assessment so they can understand the main purposes of their learning and thereby grasp what they need to do to achieve.
Evolution of Effective Teaching	Opportunities for students to express their understanding should be designed into any piece of teaching for this will initiate the interaction through which formative assessment aids learning. The dialogue between students and a teacher should be thoughtful, reflective, focused to evoke and explore understanding, and conducted so that all students have an opportunity to think and to express their ideas.

Table 5.17 continued

	Feedback on tests, seatwork, and homework should give each student guidance on how to improve, and each student must be given help and opportunity to work on the improvement.
Issues for Teachers	1. The nature of each teacher's beliefs about learning. 2. The beliefs teachers hold about the potential of their students for learning. All students can learn more effectively if one can clear away obstacles to learning, be they cognitive failures never diagnosed or damage to personal confidence or a combination of the two. Managing formative assessment that works with assumptions of "untapped potential" helps all students to learn and can give particular help to those who have previously struggled.
Policy and Practice	There is a need to focus on the inside of the "black box" and to explore the potential of assessment to raise standards directly as an integral part of each student's learning work. Steps to implementation: 1. Learning from development 2. Dissemination 3. Reducing obstacles 4. Research

Adapted from Black & Wiliam (1998b).

In 2002, Stiggins proposed a plan of action for maximizing student achievement that would provide both assessment *of* learning (currently in place) and assessment *for* learning. He urged education officials, policy makers, and local school leaders to allocate resources in equal proportions to ensure the accuracy and effective use of assessments both of and for learning. Specifically the action plan calls for the following:

Match Dollar Investment	In instruments and procedures for assessment *of* learning with assessment *for* learning
PD for Teachers	Comprehensive, long-term professional development programs to foster literacy in classroom assessment for teachers
PD for Administrators	Similar PD program in large-scale and classroom assessment for administrators including how to provide leadership in this area
Licensing Standards	Change teacher and administrator licensing standards to include expectation of competence in both assessment *of* and *for* learning.
Preparation Programs	Require teacher and administrator preparation programs to ensure graduates are assessment literate (p. 765).

Accountability

Accountability is essentially about *who* is responsible for *what* and to *whom*? There are at least four goals for accountability systems:

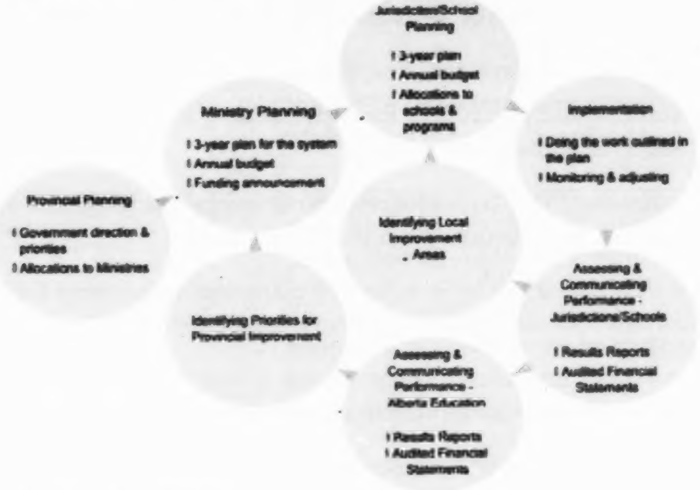
1. to improve student learning
2. to monitor the success of the educational enterprise
3. to continuously improve education (schools, systems)
4. to discharge responsibility for the education of children

Tools that help to focus accountability on student learning and improved performance include planning, indicator systems, student assessment and evaluation programs, evaluation, opinion surveying, and public reports.

Alberta has a well-established accountability system that has been refined and extended since the early 1980s. Milestones include the Minister's Advisory Committee on Student Achievement (MACOSA) established in 1976 to study problems around student achievement and to recommend solutions. MACOSA issued its report in 1979 and recommended periodic assessment of students' knowledge, skills, and attitudes in selected subjects. This type of assessment would serve two purposes: to provide feedback to the public, including reports on how local systems meet educational goals and objectives set by the province, and to inform decision making on the maintenance and improvement of the quality of instruction.

In 1982 Alberta introduced the Provincial Achievement Tests and in 1984 reinstated Diploma Examinations. In 1985 Alberta introduced the Annual Education Report. The province expanded accountability in 1995. For detailed information on Alberta's accountability system visit the website at http://www.education.gov.ab.ca/ Figure 5.5 presents Alberta's current accountability cycle.

Figure 5.5: Alberta's Accountability Cycle


Jurisdiction/School Planning
I 3-year plan
I Annual budget
I Allocations to schools & programs
Implementation
I Doing the work outlined in the plan
I Monitoring & adjusting
Ministry Planning
I 3-year plan for the system
I Annual budget
I Funding announcement
Provincial Planning
I Government direction & priorities
I Allocations to Ministries
Identifying Local Improvement Areas
Assessing & Communicating Performance - Jurisdictions/Schools
I Results Reports
I Audited Financial Statements
Identifying Priorities for Provincial Improvement
Assessing & Communicating Performance - Alberta Education
I Results Reports
I Audited Financial Statements

Alberta Education (2005b).

A special issue of the *Canadian Journal of Education* (McEwen, 1995) featured accountability in education in Canada, as well as in five provinces: British Columbia, Alberta, Ontario, Quebec, and Newfoundland. It also included perceptions of the major national stakeholder associations on the approaches to accountability.

Over the past decade there have been several publications related to accountability, among them Reeves (2000; 2004), de Broucker and Sweetman (2002), Parsons (2002), McEwan and McEwan (2003), and Holcomb (2004).

Reform is intended to be systemic. Chatterji (2002) synthesized research on standards-based reforms and accountability, with specific attention to purposes, models, and methods of inquiry. She examined the extent to which studies were guided by designs that explicitly or implicitly acknowledge a system, and evaluated the utility of the designs in generating information to support large-scale systemic changes in education.

Components of systemic reform:

1. Establishment of challenging standards in the academic disciplines that define what students should know and be able to do.
2. Alignment of curriculum and instruction, assessment and accountability, and teacher certification and professional development with the new academic standards.
3. Revamping school governance structures, allowing schools and teachers greater autonomy in how they organize instructional programs to achieve high standards of student performance at the local level (p. 347).

Chatterji's analysis involved 63 empirical studies. The academic research articles dealt largely with theoretical or substantive issues on reform (19 of 25), at the national, multistate, or general level (12), were predominantly quantitative (12) or qualitative (13) (p. 359). The review also included 38 evaluation research articles of which the largest number were process evaluations (24 of the 38), national or multistate in scope (21), predominantly quantitative (18), predominantly qualitative (12), K-12 programs and standards-based reforms (24), and sponsored by the U.S. Department of Education, federal agency, or Congress (25) (p. 369). Given the larger legislative and policy context of the reform movement, useful models of research would fall predominantly in the evaluation category. Academic research, although equally important and necessary, has a complementary role in such initiatives. Reform efforts in individual schools and larger organizational systems were largely unfocused and nonsystemic. She concluded that research efforts, too, have been largely nonsystemic in design and have thereby failed to help individual schools, school systems, and state systems to develop in strategic directions consistent with the mission of reforms (p. 377). There appeared to be little consistency or coherence in the way in which reforms had filtered down to districts, schools, and classrooms.

Systemic models employ integrative designs that can be used to illuminate the functioning of a system as a whole or any of its parts. Systemic studies could inform higher authorities on when it is reasonable to hold a system accountable for outcomes. Decision makers operating at various levels of the system could receive information they need in order to align context, input, and process variables to strategically attain the desired outcomes (p. 378).

5.5 Building Capacity

Professional development is a process that is intentional, ongoing, and systemic[40].

Effective professional development requires that continuous inquiry be embedded in the daily life of the school.[41]

There is a large body of literature on building capacity through professional development. The seminal reference, *Evaluating Professional Development* (Guskey, 2000), is a recommended resource for all teachers. The premise underlying the book is that staff development has value only if it improves student learning. The book includes chapters on professional development, evaluation, guidelines and the five levels for evaluating professional development, and presenting evaluation results.

The National Staff Development Council (2001) established standards for learning communities, leadership, resources, data-driven, evaluation, research-based, design, learning, collaboration, equity, quality teaching, and family improvement.

Professional Development

There are several reasons for the growing interest in evaluating professional development (PD). These include a better understanding of the dynamic nature of PD, recognition of PD as an intentional process, the need for better information to guide reform efforts, and increased pressure for accountability (Guskey, 2000).

PD is not a monolithic enterprise. It can take many approaches, among them observation/ assessment, involvement in a development/improvement process, study groups, inquiry/action research, individually guided activities, and mentoring.

The advantages of evaluating PD in terms of impact on student learning outcomes include offering new perspectives on old problems, promoting high expectations and more rigorous standards, broadening perspectives on the factors that influence PD, and empowering professional developers to make what they do count (Guskey, 2000, p. 210). The five critical levels of PD evaluation are participants' reactions, learning, and use of new knowledge and skills, organizational support and change, and student learning outcomes (pp. 79-81). challenges in evaluating participants' use of new knowledge and skills include identifying critical indicators of use, specifying dimensions of quantity and quality, determining if adequate time was provided, and allowing sufficient flexibility for contextual adaptations (p. 179).

In a review of professional development, Reitzug (2002) found staff development practice to be limited, fragmented, and marginalized. He found evidence of the significance of the relationship between the content and quality of PD and student achievement, as long as staff development adheres to principles that:

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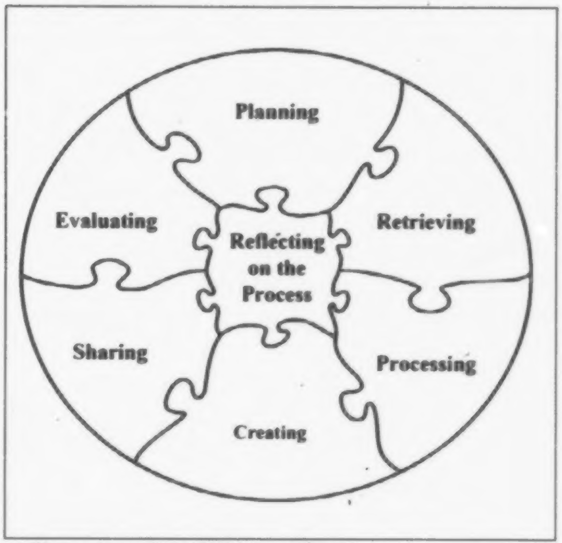
[40] Guskey (2000, p. 16).

[41] Reitzug (2002, p. 124).

- emphasize school-level control
- focus on student learning and instruction
- commitment of time and resources to implement development over an extended period of time
- development of PD styles that engage teachers collaboratively rather than focusing on them as individuals
- effective PD requires that continuous inquiry be embedded in the daily life of the school (Reitzug, 2002, p. 124)

Focus on Inquiry (Alberta Learning, 2004a) was developed to help teachers implement inquiry-based learning in their classrooms. Inquiry-based learning is a component of all Alberta curricula. The model (Figure 5.6) can be used by all teachers (K -12) in guiding inquiry with students. The model also serves as a useful approach for professional development.

Figure 5.6: Inquiry Model



Alberta Learning (2004a, p. 7).

The model is based on more than 30 years of research from around the world.

Research shows that inquirers follow a general cognitive and affective pattern. The inquiry process is highly individual, nonlinear, flexible, and recursive. Experienced inquirers tend to do more "looping back" since they are comfortable with the process. Through reflecting on the process, all learners become comfortable with the nonlinear, individual, flexible, and recursive nature of inquiry (p. 9).

The model is useful because it acts as a scaffold for instruction, a gauge for feelings, a common language for teachers and students, a guide for students, and a guide for monitoring. Metacognitive skills are transferable to new situations. A systematic approach ensures the opportunity to engage in inquiry, to learn an overall process, and to understand this general inquiry process can be transferred to other situations.

A Guide to Comprehensive Professional Development Planning (Alberta Education Partners[42], 2005) is based on a review of the literature[43] and the collective wisdom of the education partners in Alberta. It is intended to support school authorities and schools in developing comprehensive PD plans that engage staff individually and collectively to improve their practice and enhance student learning. The guide identifies 34 PD strategies and activities.

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[42] The partners who prepared the guide include Alberta Education, Alberta Regional Professional Development Consortia, Alberta School Boards Association, Alberta Teachers' Association, College of Alberta School Superintendents, and Alberta Faculties of Education.

PD designs can be district wide, based in a school, or use an integrated approach. The guide operates in a context where planning and reporting are critical components for government, school jurisdictions, schools, and professional staff. Provincial policy requires Individual Professional Growth Plans, Annual Education Plans and Annual Education Results Reports for both for school jurisdictions and schools.

Professional Learning Communities

A professional learning community (PLC) is a type of professional development currently in vogue. First popularized by Hord (1997), there are currently several proponents of this approach including the DuFours and Eaker.

Hord (1997) defined a PLC as a community of continuous inquiry and improvement. Her list of attributes included supportive and shared leadership, collective creativity, shared values and vision, supportive conditions, and shared personal practice. Perceived outcomes for both teachers and staff follow in Table 5.18.

Table 5.18: Summary of Perceived Staff and Student Outcomes from PLCs

Staff Outcomes	**Student Outcomes**
• reduced isolation of teachers	• decreased dropout rate and fewer classes "cut"
• increased commitment to school's mission and goals	• lower rates of absenteeism
• shared responsibility for students' development and collective responsibility for students' success	• increased learning that is distributed more equitably in smaller high schools
• learning that defines good teaching and classroom practice	• larger academic gains in math, science, history, and reading than in traditional schools
• meaning and understanding of content and roles teachers play in helping students achieve expectations	• smaller achievement gaps between students from different backgrounds

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[43] InPraxis conducted the literature review, which contains five sections: conceptions and understandings of professional development; processes and approaches, effective environments, evaluation of PD, and indicators of effectiveness.

Table 5.18 continued

Staff Outcomes	**Student Outcomes**
• higher likelihood that teachers will be well informed, professionally renewed, and inspired to inspire students • more satisfaction, higher morale, and lower rates of absenteeism • advances in adapting teaching for students • commitment to making significant and lasting changes • higher likelihood of undertaking fundamental, systemic change	

Adapted from Hord (1997, pp. 33-34).

The National Association of Elementary School Principals (NAESP, 2002) developed a set of standards for leading learning communities. The six standards, which are very similar to the components of school improvement and based on the effective schools literature, follow:

1. Balance management and leadership roles
2. Set high expectations and standards
3. Demand content and instruction that ensure student achievement
4. Create a culture of adult learning
5. Use multiple sources of data as diagnostic tools
6. Actively engage the community

Richard and Rebecca DuFour have collaborated extensively with Robert Eaker to advance PLCs. Recent books include *Whatever It Takes* (DuFour, DuFour, Eaker, & Karhanek, 2004), which addresses how PLCs can respond when students do not learn, and *On Common Ground* (DuFour, Eaker, & DuFour, 2005), a collection of chapters written by notable scholars. This volume contains an overview of PLCs, critical questions, creating PLCs, placing them in a broader context, and a call to action.

Alberta Education commissioned a literature review of professional learning communities to respond to Recommendation 13 of Alberta's Commission on Learning[44] (2003) which states that every school should operate as a professional learning community dedicated to continuous improvement in students' achievement (p. 65). The literature review (InPraxis, 2006b) examines conceptions and attributes and discusses benefits. It concludes with an extensive annotated bibliography.

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[44] Alberta's Commission on Learning (2003) presented a report and 95 recommendations to Alberta Learning, which has accepted 87 of the recommendations.

Table 5.19 summarizes selected sources of information on professional learning communities. The matrix demonstrates that there is a large degree of overlap among the sources and the proposed criteria, establishing content validity of the criteria.

Table 5.19: Summary of PLC Attributes by Various Proponents

Attributes	**Hord (1997)**	**DuFour & Eaker (1998)**	**NAESP (2002)**	**Berlinger-Gustafson (2004)**	**Florida (2004)**
Supportive and shared leadership	Supportive and shared leadership		Engage community to create shared responsibility	Supportive and shared leadership	
Focus/Goals			Place learning at the centre		Focus/goals
Shared vision, mission and values	Shared values and vision	Shared mission, vision, and values	High expectations and standards	Shared values and vision	Shared norms
Collaborative teams	Shared personal practice	Collaborative teams	Content and instruction that ensure student achievement	Supportive conditions (physical & human capacities)	Collaboration
Collective inquiry	Collective creativity	Collective inquiry		Collective creativity	De-privatization of practice
Continuous improvement	Supportive conditions	Continuous improvement	Culture of continuous learning		Reflective practice
Results orientation		Results orientation	Multiple data sources		Data collection and analysis
Action orientation		Action orientation and experimentation			

5.6 Engagement

Engaging schools promote a sense of belonging by personalizing instruction, showing an interest in students' lives, and creating a supportive, caring social environment[45].

Student Engagement

Engaging Schools (National Research Council[46], 2004) is the result of the committee's task "to review, synthesize, and analyze research on academic engagement and motivation that might apply to urban high schools" (p. 2). The committee drew on psychological research on motivation, studies of the effects of various educational polices and practices on student engagement and learning, and students' own voices. In the words of the committee:

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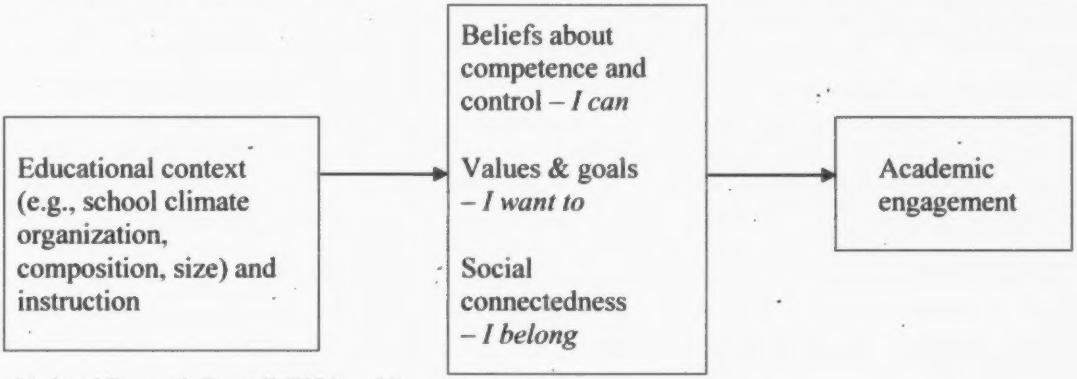
[45] National Research Council (NRC, 2004, p. 3).

[46] The Committee on Increasing High School Students' Engagement and Motivation to Learn, Deborah Stipek (Chair).

> Although learning involves cognitive processes that take place within each individual, motivation to learn also depends on the student's involvement in a web of social relationships that supports learning. The likelihood that students will be motivated and engaged is increased to the extent that their teachers, family, and friends effectively support their purposeful involvement in learning and in school. Thus a focus on engagement calls attention to the connection between a learner and the social context in which learning takes place. Engaging schools promote a sense of belonging by personalizing instruction, showing an interest in students' lives, and creating a supportive, caring social environment. (NRC, 2004, p. 3)

NRC reviewed the empirical evidence on educational conditions that promote intellectual engagement. The committee found that the evidence suggests that the effect of the educational context on engagement is partially mediated by three sets of psychological variables – beliefs about competence and control, values and goals, and a sense of social connectedness. This theory is presented in Figure 5.7..

Figure 5.7: A Theory on Educational Conditions that Promote Intellectual Engagement


Educational context (e.g., school climate organization, composition, size) and instruction
Beliefs about competence and control – *I can*
Values & goals – *I want to*
Social connectedness – *I belong*
Academic engagement

National Research Council (2004, p. 34).

The committee made ten recommendations as a means to achieve the goals of meaningful engagement and genuine improvement in achievement.

1. High school courses and instructional methods be redesigned in ways that will increase adolescent engagement and learning.

2. Ongoing classroom-based assessment of students' understanding and skills.

3. Preservice teacher preparation programs provide high school teachers deep content knowledge and a range of pedagogical strategies and understandings about adolescents and how they learn, and that schools and districts provide practicing teachers with opportunities to work with colleagues and to continue to develop their skills.

4. Schools provide the support and resources necessary to help *all* high school students to meet challenging standards.

5. Tests used to evaluate schools, teachers, and students assess high-level, critical thinking, and that they incorporate broad and multidimensional conceptions of subject matter that includes fluency, conceptual understanding, analysis, and application.
6. Districts should restructure comprehensive urban high schools to create smaller communities that foster personalized and continuous relationships between teachers and students.
7. Both formal and informal tracking by ability be eliminated. Alternative strategies should be used to ensure appropriately challenging instruction for students who vary widely in their skill levels.
8. School guidance and counseling responsibilities be diffused among school staff, including teachers, who are supported by professionals.
9. Efforts be made to improve communication, coordination, and trust among the adults in the various settings where adolescents spend their time. These settings include homes, religious institutions, and the various organized extracurricular activities sponsored by schools and community groups.
10. Schools make greater efforts to identify and coordinate social and health services in the community, and that policy makers revise policies to facilitate students' access to the services they need (NRC, 2004, pp. 3-9).

The Programme for International Student Assessment (PISA) provides a wealth of information about 15-year-old students' literacy in reading, mathematics, and science. OECD (2003) released *Student Engagement at School* which describes students who participated in PISA 2000. Five types of students and their characteristics are presented in Table 5.20. Seven in ten students had average or high literacy[47]. Engaged students are those who have a high sense of belonging and above average participation.

Table 5.20: Student Engagement at School

Student Category	Percent	Characteristics
Top students	26	High literacy, above average belonging and participation
Engaged students	27	High belonging, above average participation, average literacy
Students feeling isolated	20	Low belonging, above average participation and literacy
Absent students	10	Very low participation, low literacy, average belonging
Non-academic students	17	Very low literacy, below average belonging, average participation

Adapted from OECD (2003, p. 10).

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[47] The OECD average is 500 with two thirds of students scoring between 400 and 600.

Parental Involvement

Epstein (2001) has written extensively on school, family, and community partnerships. Her book is divided into two parts – the first on understanding these partnerships and the second on applying research. Her model of overlapping spheres of influence of family, school, and community on children's learning accounts for history, development, and changing experiences of parents, teachers, and students (p. 27).

Epstein postulates six types of involvement for comprehensive partnerships.

1. Parenting – Help all families establish home environment to support children as students.
2. Communicating – Design effective forms of school-to-home communications about school programs and children's progress.
3. Volunteering – Recruit and organize parent help and support.
4. Learning at Home – Provide information and ideas to families about how to help students at home with homework and other curriculum-related activities, decisions and planning.
5. Decision Making – Include parents in school decisions, developing parent leaders and representatives.
6. Collaborating with the Community – Identify and integrate resources and services from the community to strengthen school programs, family practices, and student learning and development (Epstein (2001, p. 408).

Epstein identifies sample practices, challenges, and redefinitions as well as expected results for students, parents, and teachers of the six types of involvement.

Desforges and Abouchaar (2003) found that parental involvement can take many forms. The extent and form of involvement is influenced by family social class, maternal level of education, material deprivation, and maternal psycho-social health and single parent status. Involvement diminishes as the child gets older. Involvement is positively influenced by the child's level of achievement. At-home relationships and parental modeling of aspirations play the major part in impacting student outcomes; involvement works indirectly on school outcomes by helping the child build a pro-social, pro-learning self-concept and high educational aspirations.

Downey (2002) reviewed the research evidence relevant to understanding the relationship between parental involvement and children's performance in school. Indicators of parental involvement with school (e.g., attendance at school events, parent/teacher conferences) have mixed associations with children's school performance. Measures of parental involvement at home (e.g., talking to children about school-related matters, high educational expectations, warm and consistent discipline) show consistent associations with children's school success. Downey recommended that:

- Programs designed to promote parent/teacher interaction should be continued, but with greater emphasis on initiatives designed to improve the parent/child relationship.
- Programs be promoted that increase the amount of time low-income children are exposed to school-based activities, whether through more after-school programs, summer activities, or year-round schooling (p. 57).

Lugg (2002) found that research on public schools and their communities was largely limited to case studies. Nevertheless, research has documented a wide range of programs that have expanded public schools' involvement with the communities in which they operate. These programs face a variety of challenges that range from institutional rivalries to competition for scarce financial resources. Operated effectively they can contribute to improved achievement by students living in poverty. Lugg's recommendations follow.

- Basic parental involvement programs should be enhanced to include multiple opportunities for formal and informal communication between school personnel and parents.
- Parental involvement programs should embrace the ethnic, linguistic, cultural, racial, and religious diversity of the parents.
- These programs should be designed to be sensitive to the special needs of poor parents, single parents, parents with large families, and families where both parents work outside the home.
- Written materials should be provided in the language with which parents are the most familiar.
- Schools and other social organizations wishing to provide school-linked services should carefully consider the scope, funding needs, organizational and professional complexities, and types of services to be offered.
- Funding for new community involvement projects should be kept consistent and stable. The bigger and more complex the project, the greater the need for adequate funding.
- Extracurricular programs should be kept vital to help foster strong parental involvement.
- Educational leaders and policy makers should be encouraged to reconceptualize the public school as a vital economic resource that must be nurtured (Lugg, 2002, p. 67).

In the Canadian National Survey (Guppy *et al.*, 2005) both parents and teachers were asked how important parental participation is in four areas: parent- teacher meetings, school committees, school improvement planning, and hiring a principal. See Table 5.21. More parents than teachers rated parental participation in parent/teacher meetings as important (94% and 79%, respectively). They also highly rated parental participation in school committees and school improvement planning. Both respondent groups rated parental involvement in hiring a principal less important.

Table 5.21: Canadian Parent and Teacher Views on Parental Involvement

How important is parental participation in:	**Parents**	**Teachers**
	% Important	
Parent/teacher meetings	94	79
School improvement planning	85	74
School committees	81	88
Hiring the principal	59	43

Source: ACE National Survey, 2005.

5.6 Sustainability

The language of real change needs not just explanation theories, or even action theories, but good action poetry – action theories that are built for action – simple, memorable, and evocative[48].

Fullan has written extensively on educational reform. He coined the 3-6-8 rule[49], meaning that it takes about three years to turn around an elementary school from poor to good performance as measured by student progress, about six years to turn around a high school, and about eight years for a whole district. He noted three problems with these findings:

1. Many people think the timeline is too long.
2. Only a small proportion of schools or districts that should be improving are actually doing so. This is the problem of scale.
3. It takes a great deal of effort to accomplish the turnaround, which can be undone if two or three key people leave.

Thus, sustaining reform remains elusive (Fullan, 2002, p. 141).

In *Leadership & Sustainability*, Fullan (2005) identified eight elements of sustainability.

1. Public service with a moral purpose
2. Commitment to changing context at all levels
3. Lateral capacity building through networks
4. Intelligent accountability and vertical relationships (encompassing both capacity building and accountability)
5. Deep learning
6. Dual commitment to short-term and long-term results
7. Cyclical energizing
8. The long lever of leadership (p. 14)

Kegan and Lahey (2001 cited in Fullan 2005) presented seven "languages of transformation" summarized in Table 5.22.

Table 5.22: Languages of Transformation

From the language of:		To the language of:
complaint		commitment
blame		personal responsibility
"New Year's resolutions"	►	competing commitments
big assumptions that hold us		assumptions that we hold
prizes and praising		ongoing regard
rules and policies		public agreement
constructive criticism		deconstructive criticism

Adapted from Kegan & Lahey (cited in Fullan, 2005, p. 48).

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[48] Perkins (2003, p. 213, cited in Fullan, 2005, p. 102).

[49] Fullan (2002).

System or organizational intelligence is very hard to achieve (Perkins 2003 cited in Fullan, 2005) for at least six reasons summarized in Table 5.23.

Figure 5.23: Reasons Why Organizational Intelligence is Difficult

Reason	Description
1. The five brain backlash	Too many voices making things unproductively complicated
2. Cognitive oversimplification	Human tendency to oversimplify cognitive processing
3. Emotional oversimplification	Human tendency to oversimplify emotions
4. Regression in the face of stress	Under stressful conditions, individuals and groups are more likely to revert to regressive behavior (e.g., anger, frustration, withdrawal)
5. Domino effect	One person's regressive behavior tips others in the same direction
6. Power advantage	Power figures sometimes take advantage of regressive interactions

Adapted from Perkins (cited in Fullan, 2005, pp. 99-100).

Change is dynamic and complex. Change is hard work and takes time.

> It takes less skill to resist than to learn. Resistance comes naturally; learning complicated things in a group setting does not. It is easy for people to avoid or fail to persist in the deep, cognitive, emotional, and political learning cycles that will be needed to sustain the group's focus on complex new challenges. Fullan (2005, p. 101)

Fullan (2005) concluded that increasing the chances for greater sustainability is to build a critical mass of developmental leaders who are flexible and surround themselves with other leaders. People find meaning by connecting to others and well-being by making progress on problems that are important to their peers and of benefit beyond themselves (p. 104).

6 SUMMARY AND SYNTHESIS

Summary

This section summarizes the report. Schools are microcosms of society. They are not independent of their communities, their provinces, or their countries. Families, schools, and society have a vested interest in improving education because it pays social and economic dividends. A future orientation, coupled with ongoing improvements, contributes to raising standards over the short, medium, and long terms.

Chapter 1 provides information about Alberta, which has a strong and well-established K-12 education system. Alberta's school-aged population is becoming more diverse with growing numbers of Aboriginal and immigrant students. Approximately one in five Alberta children is at risk.

Alberta enjoys a reputation as a leader in education. The province is recognized for its centralized curriculum, assessment programs, teacher education, distance learning, and communications technology. It also has a strong accountability system which requires the province, school authorities, and schools to prepare annual plans and reports to present the results of various programs, initiatives, and strategies. A variety of performance measures indicates there is room for improvement in student achievement and high school completion.

Chapter 2 discusses student learning, which is the goal of education. Education is a social enterprise for promoting shared values and common goals. Schooling aims to develop individuals so they become contributing members of society. There is a large body of evidence on ways to improve learning.

Publicly funded education represents our collective wisdom in providing opportunities and resources for our youth to become productive members of society. Families, schools, and society have a vested interest in improving education. Individual benefits include knowledge, skills, personal satisfaction, health, and higher earnings associated with more education. Societal benefits include better health, lower crime, economic growth, and social cohesion.

Chapter 3 discusses change, the new constant. Accelerating changes in all areas of life – demographic, social, economic, and technological – have important effects on education. What students learn today must prepare them for a future more than a decade hence when they will take their place as productive members of society both economically and socially. They must develop the knowledge, skills, and attitudes to earn a living, and respect and value our increasingly pluralistic society. They must continue to learn and embrace change as an opportunity rather than a challenge throughout their lifetimes.

Each generation has different attributes, likes, and dislikes. Most educators belong to the Baby Boomers and Generation X whereas their students can be described as Millennials. These Net Generation students are digitally literate, connected, experiential, social, visual and kinesthetic, while those responsible for teaching them may be resistant to change, which exacerbates the 'generational divide' separating them.

Addressing people's stages of concern and levels of use helps them to deal with change. Systemic reform must address several issues simultaneously. Changing the education system requires examining the teaching/learning process and its support systems. A major issue is the inertia that resists change and fosters "business as usual".

Chapter 4 presents models of educational performance. The traditions of school effectiveness and improvement have different origins and intentions. School effectiveness provides a knowledge base (what works and why) while school improvement provides the vehicle (policies and practices) to change education in the desired direction. Today the two traditions are usually merged.

The chapter also presents some large-scale initiatives that are based on school effectiveness and improvement. The four models include First Things First (FTF), Comprehensive School Reform (CSR), National Literacy and Numeracy Strategies (NLNS), and the Alberta Initiative for School Improvement (AISI).

Chapter 5 presents research-based ways to improve schools. These include leadership, instructional practices, school climate, data driven decisions, building capacity, engagement, and sustainability.

5.1 **Leadership** encompasses different domains including authentic, visionary, cultural, quality, and service. A recent meta-analysis of principals' leadership responsibilities found situational awareness, flexibility, monitoring/evaluating, outreach, and discipline to be most highly correlated with student achievement. Covey's (2004) 8th Habit and Collins' (2001) Level 5 Executive Leader propose strategies for going from 'good to great'.

5.2 **Instructional strategies** that have a high probability of enhancing student achievement for all students in all subject areas at all grade levels include identifying similarities and differences, summarizing and note taking, reinforcing effort and providing recognition, homework and practice, nonlinguistic representations, cooperative learning, setting objectives and providing feedback, generating and testing hypotheses, and questions, cues and advance organizers. AISI Cycle 1 found the most effective instructional strategies to be reading with parents at home, technology integration, small groups, counseling, and peer assistance.

5.3 A positive **school climate** requires trust (capacity, character, and disclosure). Inquiry-based learning contributes to a positive school climate. A recent Canadian survey found that both parents and teachers consider creating a safe, caring, and respectful environment the most important job of the principal.

5.4 **Data driven decisions** are informed when they are based on a variety of sources. The review includes sections on literacy (data, statistical, information), evaluation (the systematic investigation of merit or worth), assessment (processes for determining learning), and accountability (who is responsible for what and to whom). Accurate, reliable, and timely evidence is the lifeblood of informed decision making.

5.5 **Building capacity** refers to teachers and administrators continuing their professional development over the life of their careers. Professional development is a process that is intentional, ongoing and systemic, and requires that continuous inquiry be embedded in the daily life of the school. While there are many approaches to professional development, the goal must be on improving student learning.

5.6 **Engagement** relates to schools, students, and parents. Engaging schools promote a sense of belonging by personalizing instruction, showing interest in students, and creating a supportive social environment. A theory of educational conditions that promote academic engagement include student beliefs about competence and control (*I can*), values and goals (*I want to*), and social connectedness (*I belong*). A recent study categorized students into five categories, one of which was engaged (representing one in four students).

Parental involvement takes many forms, is influenced by a number of factors, diminishes as children get older, and can positively impact children's self-concept and aspirations.

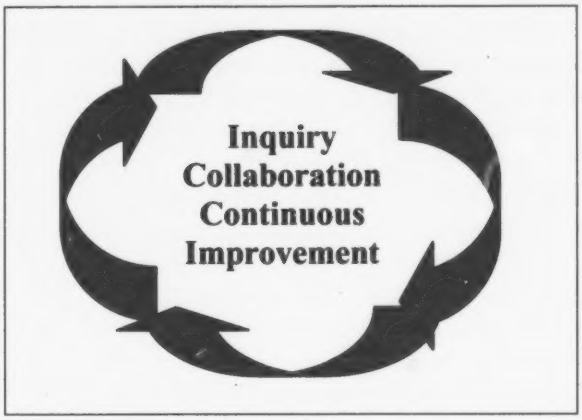
5.7 **Sustainability** is difficult because change takes concerted effort and time. Building a critical mass of people who are passionate, committed, flexible, and surrounded by like-minded individuals increases chances that a reform will be sustained. If one accepts that people are four dimensional (mind, body, heart, and spirit), then they can raise their voices (talent, need, passion, and conscience) to inspire others (pathfinding, aligning, empowering, and modeling) (Covey (2004).

Chapter 6 presents a summary and synthesis of the previous five chapters. While each chapter deals with a particular topic it is clear that there is a lot of overlap among them. The remainder of this chapter discusses the integration of the parts.

Synthesis

Figure 6.1 symbolizes synthesis. It consists of four connected arrows enclosing inquiry, collaboration, and continuous improvement. The arrows represent the iterative process of improving schools.

Figure 6.1: Synthesis



The **four arrows** can refer to:

- action (planning, developing, implementing, and evaluating)
- alignment (goals, strategies, measures, outcomes)
- inquiry (collecting, analyzing, interpreting, and reporting)
- people (mind, body, heart, spirit), and
- partners (home, school, district, government)

Inquiry, collaboration, and continuous improvement at the centre represent the *modus operandi* of school improvement.

Inquiry encompasses all the elements related to collecting, analyzing, interpreting, and reporting evidence:

- multiple approaches (methods, data sources, perspectives, levels), and
- points of reference (time, groups, targets).

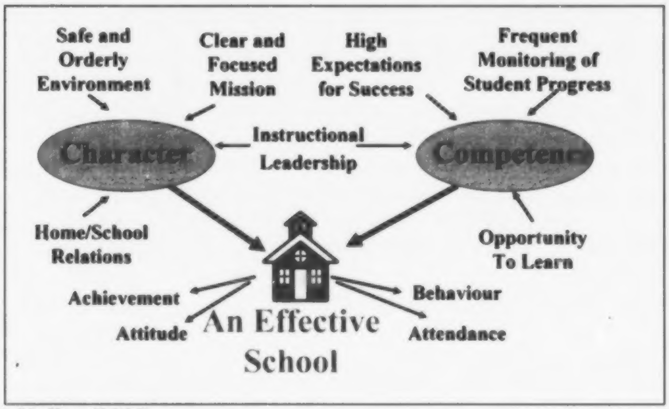
Collaboration refers to partners and institutions working together:

- partners (students, teachers, administrators, and parents) and
- institutions (home, schools, districts, communities, universities, and government).

Continuous improvement in all endeavors (learning, teaching, and schooling) is the desired outcome. It is a mindset that constantly strives to improve and to focus on the future.

Figure 6.2 presents Hulley's model of an effective school which embraces both character and competence and the seven correlates of effective schools. For schools to succeed there must be shared values, vision and purpose; everyone must know and behave according to what they collectively believe, what they will achieve, and why they are there: to ensure that students learn. Hulley (2005) articulated roles for districts, schools and staff.

Figure 6.1: Correlates of Effective Schools


Safe and Orderly Environment
Clear and Focused Mission
High Expectations for Success
Frequent Monitoring of Student Progress
Character
Instructional Leadership
Competenc
Home/School Relations
Opportunity To Learn
Achievement
Behaviour
Attitude
An Effective School
Attendance

Hulley (2005).

Five of the seven correlates above are reported in this report. Clear and focused mission and high expectations for success are embedded in data driven decisions as Alberta's accountability framework includes vision, mission, principles and beliefs[50], and provincial standards (acceptable and excellent) for student performance. Building capacity and sustainability are not identified in the figure, yet are essential to improving schools, and are thus included.

Evidence is essential for improving schools. Table 6.1 summarizes the aspects. There must be alignment among the goals, strategies, measures, and outcomes. Using multiple approaches – including methods, data sources, perspectives, and levels – triangulates and corroborates findings giving us confidence in the evidence. Multiple points of reference provide comparisons over time, groups, and targets. Annual data provide evidence for timely action while longitudinal data indicate if performance is improving or declining. Another way to compare is to examine findings from schools, districts, the province, and countries (for national and international assessments or surveys). Finally, baselines, targets, and standards provide ways to compare performance. Examining evidence in a culture of collaboration and continuous improvement ensures that action will be taken.

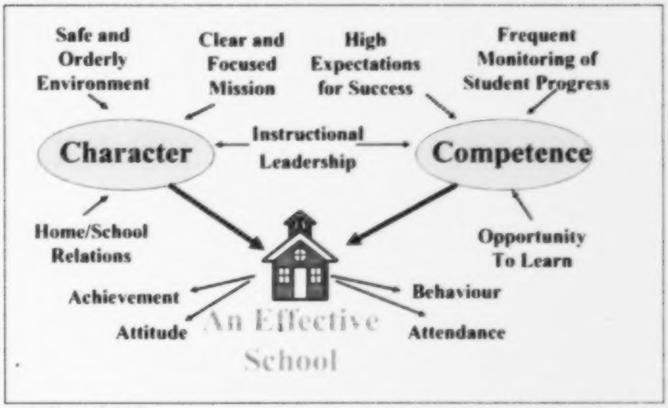
Table 6.1: Evidence is Essential for Action

Alignment	Goals, strategies, measures, outcomes
Multiple Approaches	Methods, data sources, perspectives, levels
Points of Reference	Time – annual, longitudinal Groups – schools, districts, province(s), countries Targets – baseline, improvement targets, standards
Annual Cycle	Triangulation – corroboration Interpretation – inquiry and reflection Action – based on evidence
Culture	Collaboration and continuous improvement

---

[50] The *Guide to Education Planning and Results Reporting* invites school authorities to provide foundation statements (vision, mission, principles and beliefs) which are optional (Alberta Education, 2005b, p. 5). Most districts and schools have such statements.

Figure 6.1: Correlates of Effective Schools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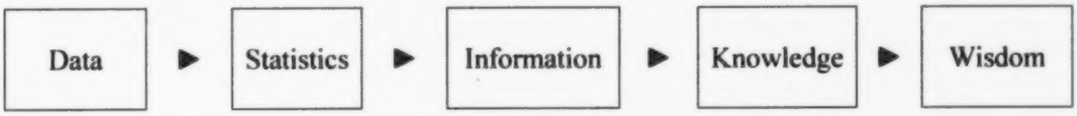
There is a large body of evidence on how to improve learning and schools. By combining data and information from many sources and methods one can generate knowledge, which can ultimately lead to wisdom in how to improve education. Figure 6.3 presents this visually.

Figure 6.3: From Data to Wisdom



This report has made a case for collecting data (both numeric and narrative) from a number of sources to provide evidence of what works to improve learning and schools. Statistics provides a way to analyze and summarize data to generate meaningful information that can be interpreted. Knowledge becomes wisdom when we exercise judgment about what we have learned and make informed decisions. Educational research points out ways to collect data from a number of sources, to analyze them through a variety of methods and statistical approaches, then to translate them into information. Corroboration of findings from several studies leads to knowledge, which experience and expertise can transform into wisdom, assuming there is a will to take wise action. It behooves us all to learn what works and wisely apply this knowledge to educational polices, practices, and programs designed to improve our schools, thereby investing in our future.

Just as life is a journey, so is our quest to improve schools. Our schools provide the best hope of educating and nurturing future generations to become citizens who are caring and contributing members of society. The future is ours to shape. A belief in our capacity to work together in a culture of continuous improvement must lead to collective actions capable of providing a positive future for all children.

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